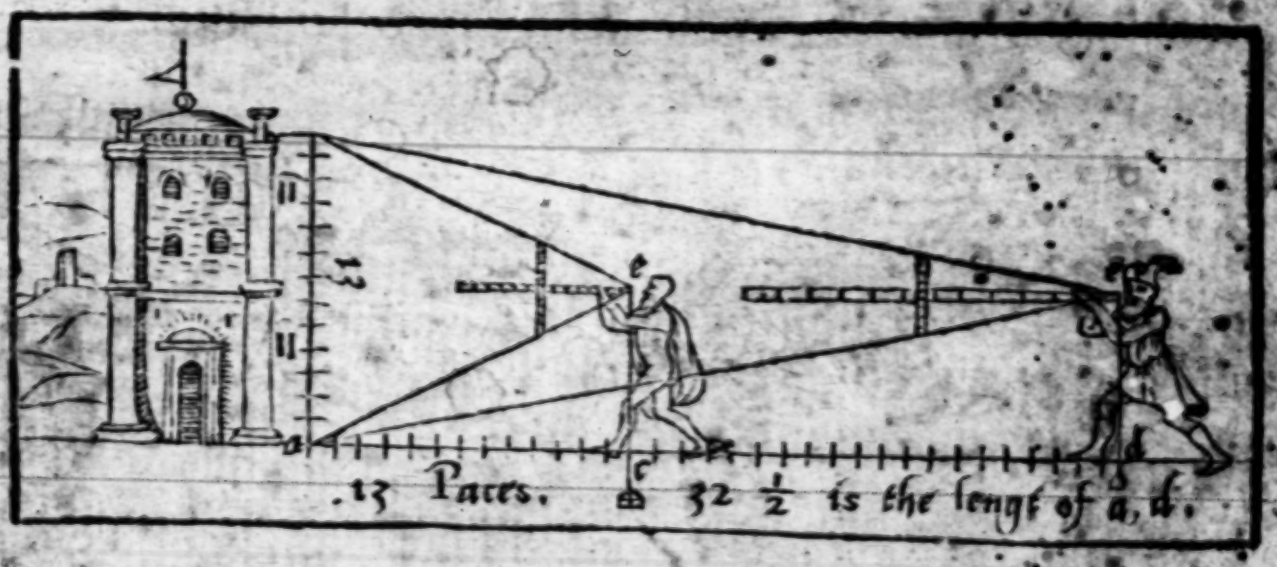
A BOKE NAMED

TECTONICON

briefely ſhewynge the exacte meaſurynge, and ſpeady reckenynge all maner Lands, ſquared Tymber, Stone, Steaples, Pyllers, Globes. ꝛc. Further, declaringe the perfecte makinge and large vſe of the Carpenters Ruler, conteyninge a Quadrant Geometricall: comprehendinge alſo the rare vſe of the Squire. And in thende a lyttle treatiſe adioyned, openinge the compoſicion and appliancie of an Inſtrument called the profitable Staffe. With other thinges pleaſaunt and neceſſary, moſt conducible for Surueyers, Landemeaters, Joyners, Carpenters, and Maſons.

Publiſhed by Leonarde Digges Gentleman, in the yere of our Lorde.

1556.



Imprynted at London by Thomas Gemini, dwellynge withyn the Blacke Friers: who is there ready exactly to make all the Inſtrumentes appertaynynge to this Booke.

ANNO. 1562.

STC

Every circle is equall to that rightangled triangle, of whose conleyning sides the one is equall to the semidiameters, the other to the perimetrie or circumference.

The proportion of every circle to the square of his dimetiente is as 11 to 14

The circumference of a circle is more than triple his diameter by suche a parte as is lesse than $\frac{1}{7}$ and more than $\frac{10}{71}$ thereof. By the former theoremes ye may collecte these rules. Multiply the circumference of any circle by 7, and divide by 22 youre quotient is the circles diameter, whose medietie multiply in halfe the circumference yeldeth the area, or multiplying the square of circles dimetient by 11, and dividing the ofcome by 14, your quotient will declare the same. Example.

Admit the circumference of the circle 44 with encreased by 7. yeldeth 308. this divided by 22 bringeth in the quotient 14. the diameter, whose medietie being 7. augmented with 22 the halfe of the circumference produceth 154. Likewise the square of 14 multiplied in 11. maketh 2156 with divided by 14 bringeth 154 the superficiall capacitie of that circle.

Jan. 27, 1902

B

L. D. vnto the Reader.

ALthought (gentle Reader) many excellente in Geometry, vppon infallible groundes haue put forth diuerse most certayne and sufficient rules, touchyng the measuring of al maner Superficiecis: yet in that the arte of numbring hath ben required (yea, chiefely those rules hyd, and as it were locked vp in straunge toungues) they do profite, or haue furdered verye lyttle the moste parte: certes nothing at al, the Landemeater, Carpenter, or Mason, wantyng the aforesayde: for theyr sakes I am here prouoked not to hide, but to open, and so encrease the talent which I haue receyued: yea, to publishe in this our tongue very shortly (if God geue life) a volume conteynynge the flowers of the Sciences Mathematical, largely applyed to our outwarde practise, most profitably pleasaunte to all maner men of this realme. In the meane time I shall desire the Artificers aboue named to be contented with this lyttle booke (a taste of my good wyll towardes them) which I wyshe euen so to farder the readers, as I knowe it suffycient for the true measurynge and readye accompte of all maner Lande, Timber, Stoone, Borde, Glasse, Pauemeut. &c.

Here mine aduise shall be to those Artificers that will profite in this, or any of my bokes, nowe publyshed, or that hereafter shall be, first confusely to reade them thorow, then with more iudgement, and at the third readmg wittely to practise. So fewe thinges shalbe vnknowen. Note, oft diligent reding, ioyned with ingenious practise, causeth profitable laboure.

Thus most hartely farewell (louinge Reader) to whom I wishe my selfe present to further thy desire and practise in these.

The pleasaunt profite, or content of this lyttle boke.

And in what it exceadeth all other publyshed.

OTher Bokes tofore put forth in our englishe tongue conteyned onely the bare measuring of Lande, Timber, and Borde: howe agreable in all places to the rules of Geometry, let the learned iudge. Here (gentle Reader) thou shalt plainely perceiue through diligent readynge, howe to measure truely and very spedely all maner Land, Timber, Stone, Steaples, Pillers, Globes, Borde, Glasse, Pauemente. &c. without trouble, not payned with many rules, or obscure termes. Nor yet with the multitude of tables, as here before hath ben: in whiche not a fewe errours were commytted: for that cause no iust accompte might any way be had. Further ye shall by this booke vnderstande the whole makinge and comely handelynge of the Carpenters Ruler, with the true measures. &c. And his vse appoynted to the ready measuringe of all kynde of Tymber, Stone, Borde. &c. Also the leauelinge of groundes, takinge of Heightes, is pleasauntly and diuersely practised by the ruler. Ye haue here not the commune but the rare vse of the Squire applied to Heightes, Lengthes. &c. and to the fyndinge of the iuste houre of the daye diuerse waies: throughe the ayde of pleasaunt tables, newely adioyned to my generall Prognostication, by the which the proporcion of thynges direct or squirewise standing, are by theyr shadowes knowen.

To conclude, in the ende of this boke is added a treatise shewyng the makynge and vse of an Instrument, by whiche ye shall get Lengthes, Heightes, Breadthes, widenesses, where, or howe soeuer they stande. Other necessary thinges are conteyned in this lyttle volume, whiche I commytte to the diligente Readers.

THE I. CHAPTER.

S there are few crafteſmen, whiche haue all the kyndes of Arithmetike readely: ſo I doo ſuppoſe none ſo ignorant but that they do, or maye eaſelye perceyue the ſimple ſignifications of theſe Caracters or figures. 1. 2. 3. 4. 5. 6. 7. 8. 9. 0. and alſo theyr ſtrength, in the firſte, ſeconde, and thirde roumes placed. *Characteres numerall.*

Beſides that, they muſt be familiar with theſe and ſuche like Fractions.

$\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{7}$ $\frac{1}{16}$ $\frac{1}{32}$ $\frac{3}{4}$ $\frac{4}{5}$ $\frac{9}{10}$ The firſte leftwarde betokeneth one ſecõd parte of an whole, be it Pearche, Inche, or any other meaſure: the nexte, one thyrde, then one ſeuenth parte: the other enſuyng, one ſixtenth. So one thirty and two partes of an Inche. Thẽ folow thre fourthes: four fiftes. The laſt is nine tenthes of an Inch: that is nine partes of an Inch, diuided into ten porcions. *Fractions.*

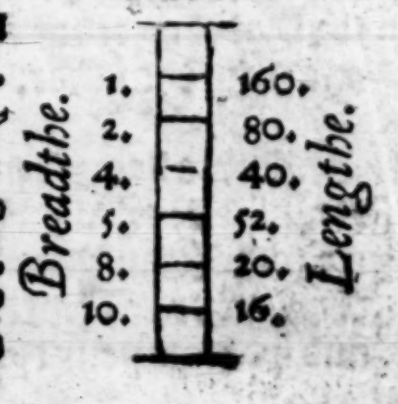
Theſe I doo intend to put in my enſamples, and in my tables, and margines folowinge, to repreſente partes of Pearches or Inches. As, if I woulde write halfe an Inche after this maner. $\frac{1}{2}$. Thre quarters of an Inche, thus. $\frac{3}{4}$ One eyght parte of a Pearche, on this wiſe, $\frac{1}{8}$. So of the reſt.

It is requiſite alſo here to open what a Pearche, a Daywoorke, a Roode, and an Acre is.

Althoughe there are diuers opinions engendred throughe longe cuſtome in many places, of the length of a Pearch (vpon whiche our chiefe matter dependethe) yet there is but one true Pearch, by Statute apoynted to meaſure by. Wherin is ordeyned. 3. barly cornes, drye, and rounde, to make an Inche: 12. Inches, a Foote. 3. Foote, a Yarde. 5. yardes and. $\frac{1}{2}$. a Pearche: 40. Pearches in lengthe, and. 4. in breadth, an Acre.

So an Acre by ſtatute ought to conteine. 160 pearches: the halfe Acre. 80. pearches: a Roode, commonly called a quarter. 40. pearches: a Daywoorke. 4. pearches. Loe here the Acre expreſſed with his length and breadthe.

Acre.



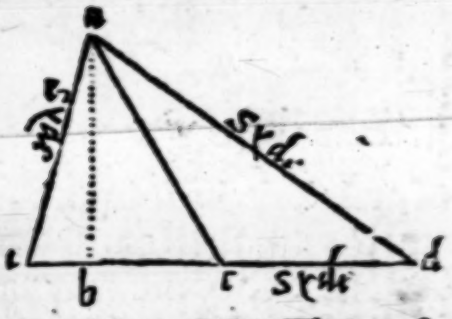
Instrumentes to measuce with Poales Corde knotted.

I must not omit here to tel you what thing is meteſt to measure land with. They vſe commonly in the country, two poales, eyther of them the length of a pearch. They are very good. Yet for al kinde of lande, a corde .5. pearches in length, well seared with ware & rosyn, knotted or marked at the ende of euery pearche, is more mete & readier. But in my fantasy, the Instrument Geometrical, which is put forthe in thende of this boke, passeth all them & other, for the exacte truth, & quickest spede. This instrument is so general & auayable to so sundry thinges, that it alone requireth a large boke, if it shoulde be sufficiently set forthe.

Profitable staffe.

Triangle.

Also I woulde not haue you ignorant what pece of lande is called a Triangle, whiche often shall hereafter be named. It is suche a fashioned piece as hath, or is imagined to haue thre sydes, and thre angles onelye: whether the sydes be equal or otherwyse as this figure sheweth. Againe, note that a lyne is sayde to fall squirewise, when it cutteth any thinge, or any syde of a Triangle full crosse, lyke vnto a Squyre: As the hanginge pricked line, a.b. in. c.d. the base line of the Triangle. Loe, it cutteth the syde squyrewise, or full crosse, in the point b. and not as the other lyne a.e. dooeth. The Base of any tryangle is here called that syde, whiche is cut squyrewise of the hanging lyne.

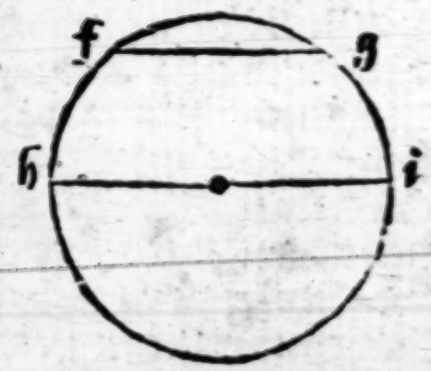


Line falling squirewise.

Base line.

Circle.
Circumference
Centre.
Diametre.
semidiametre
Arcke.
Paralleles.

Concerninge a Circle, knowe that the compasse of any circle, is named his circumference: the myddle point in him his Centre: the ryght lyne h.i. that goeth ouerthwart that Centre, touchinge the circumference on bothe sydes, is his Diametre: the halfe of that line, the Semidiametre. Also an arcke is a pece of the circumference cut away, as ye se the arcke aboue the lyne f.g. Also f.g. and h.i. in this circle are named Parallels: for that they differ equally in al places, the one from the other.



Nowe because practyse and experience sheweth me, that there is almoste no lande, but it maye easelye be broughte by imagnation, to a Triangle or Triangles, and so mooste truelye measured: therfore to be shorte, this order shalbe taken. I wyll fyrste figure and set afore your eyes Triangled Lande, and other whiche by imagination

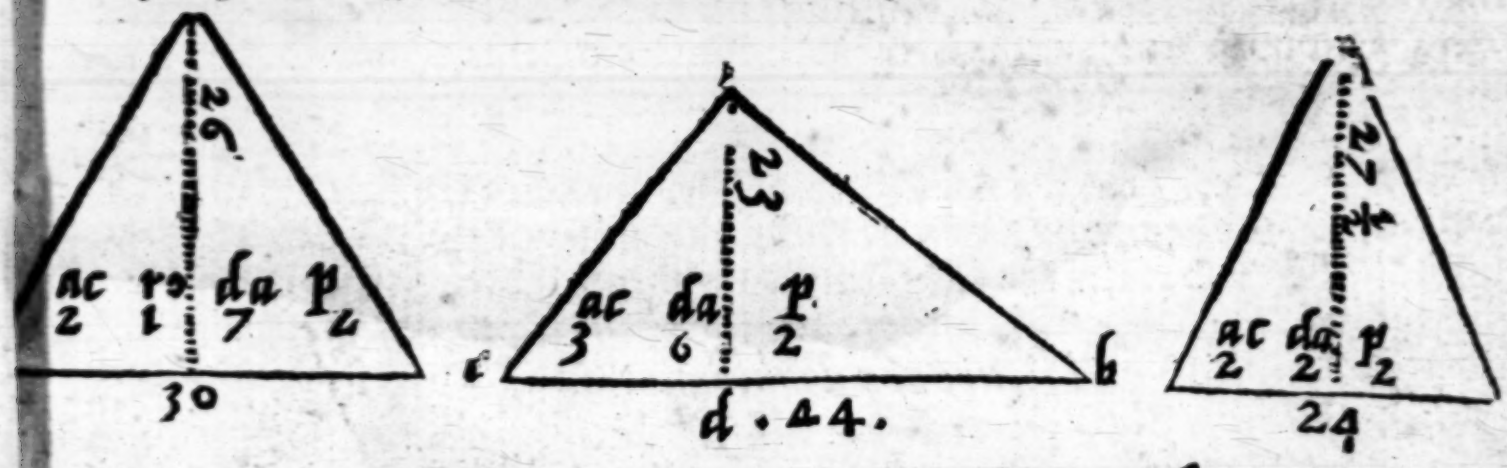
gination shalbe brought into triangles. Then I shall teache the trus measuring of them: I meane how to finde a length & breadth, with whiche ye shall enter the Table of accompt folowinge, where the acres, and odde pearches, if there be any, shall appeare. As these figures are measured, so all tryangled land, and other, brought into triangles, of what fashion soeuer they be, shalbe measured, And because it is requisite for true measuring of all triangles, to finde a streigth hanging line, I shall shewe firste howe that Lyne is to be founde, imagined, or drawen.

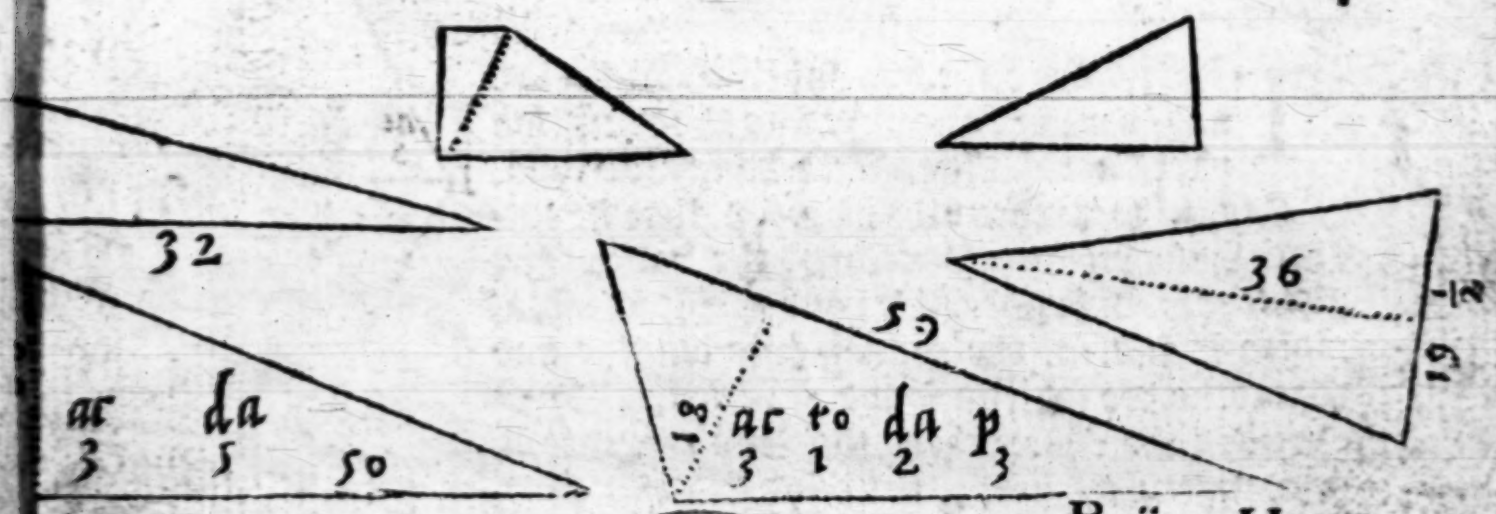
Howe the right hanging line in Triangles is drawen.

THE II. CHAPTER.

THis streygth hanging lyne in all Triangles, is euer drawen or imagined from any Angle, cuttinge some one syde of that triangle squirewyse: as ye may perceyue the pricked lynes in the triangles folowing. By the helpe of this lyne, all landes of Triangle fashion, are brought to be mesured as ensueth.

To drawe a hanginge or plumbe line.





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The Arte of
Howe to measure all maner Triangled Lande.

THE III. CHAPTER.

Euclide the firste boke, 41. pro.

IF thou be an Arithmetrician multiplie this streigth hãginge lyne, drawen as aboue is shewed, in halfe the nũber of pearches of that syde which it cutteth squirewise. For want of that knowledge, take the aforenamed pearches (I meane of the hanginge lyne, and halfe the syde which he cutteth) and with that Length and breadthe enter youre table of accompt, as there is set forth. So shall ye perceaue the nũber of Acres, Roodes, Dayworkes. &c.

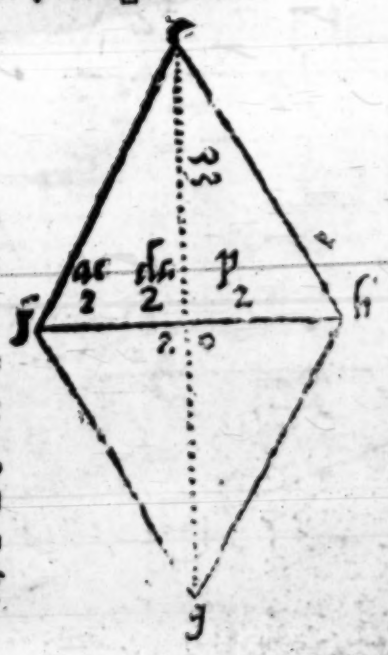
Ensample.

FOr the perfect measuring of triangles afore sygured, and all other, suppose the secõd of these laste. 9. sygures on thother syde, hauing written about it. a. b. c. d. to be a pece of land, whereof I would haue the true measure. I synde by a corde or otherwyse, the pricked hanging lyne a. d. to be. 23. Pearches: the syde b. c. whiche it cutteth squirewise. 44 Pearches, whose halfe is. 22. With these. 22. & 23. the conuenient length and breadth, I enter the table of accompte. There I synde by that table, at the corner where bothe the lynes of conuenient length and breadth do mete. 3. Acres, 6. Dayworkes, and 2. Pearches to be in that Triangle. Thus of all before sygured.

This Table foloweth.

Here note, your Table must euer be entred with al the pearches of the hanging Lyne, and with halfe the syde that he cutteth squirewyse: Or with the halfe hanging lyne, and the whole syde cut.

A figure of a double Triangle.

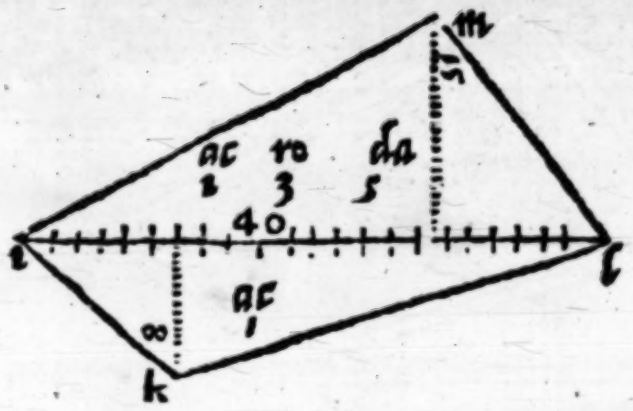


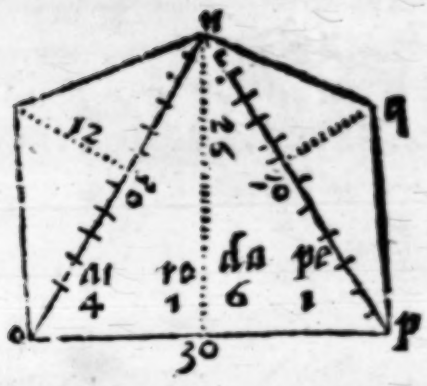
THis sygure e. f. g. h. is but two Triangles: and therefore measured as aboue in two partes: Or thus. The hangynge lyne, e. g. is. 33. Pearches: the syde. f. h. that he cutteth squirewyse. 20. Pearches, the halfe of the whiche is. 10. Nowe enter your Table as afore, with 33. and. 10. the conueniente lengthe and breadthe. So shall ye synde, 2, Acres, 2, Dayeworkes and, 2, Pearches, the true contente of this sygrue, e, f, g, h,

An

An other ensample.

ADmit.i.k.l.m. lande to be measured. Be cause it is no maner Triangle, it must be brought by imagination, as I haue saied, into a Triangle or triangles. Which imagination is here signi-





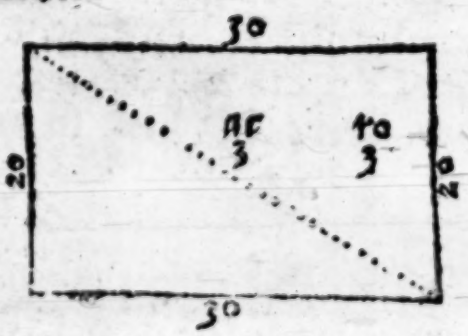
Figures of many Angles.

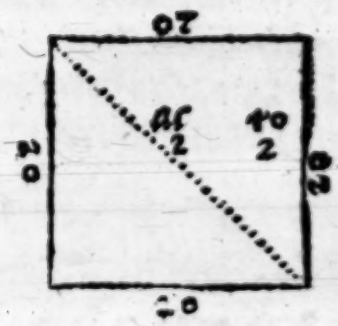
fied by the lyne dashed i.l. When as aboue is declared, it ought to be measured (accordinge to the rule of Triangles) in two partes, because there are two triangles in that lande. So by prose ye shal finde in the vpper.i.m.l one Acre.3.Rodes and.5.Dayworkes: in the other i.k.l.one Acre. Thus I gather the whole content of that lande to be 2. Acres.3.Roodes, and.5.Dayworkes.

None otherwyse of the adioyned.n.o.p.q. and all other fygures folowynge, and other whatsoeuer they are, that by any meanes may be broubht into triangles.

Furthermore knowe, that the fygure.i.k.l.m. is redely thus measured. Adde the pearches of bothe the hangynge lynes together: so haue ye.23. Wyth this number, and wyth halfe the pearches of the syde.i.l. whiche he cutteth squyrewyse, beynge.20. pearches, enter your table: so is founde as afore.

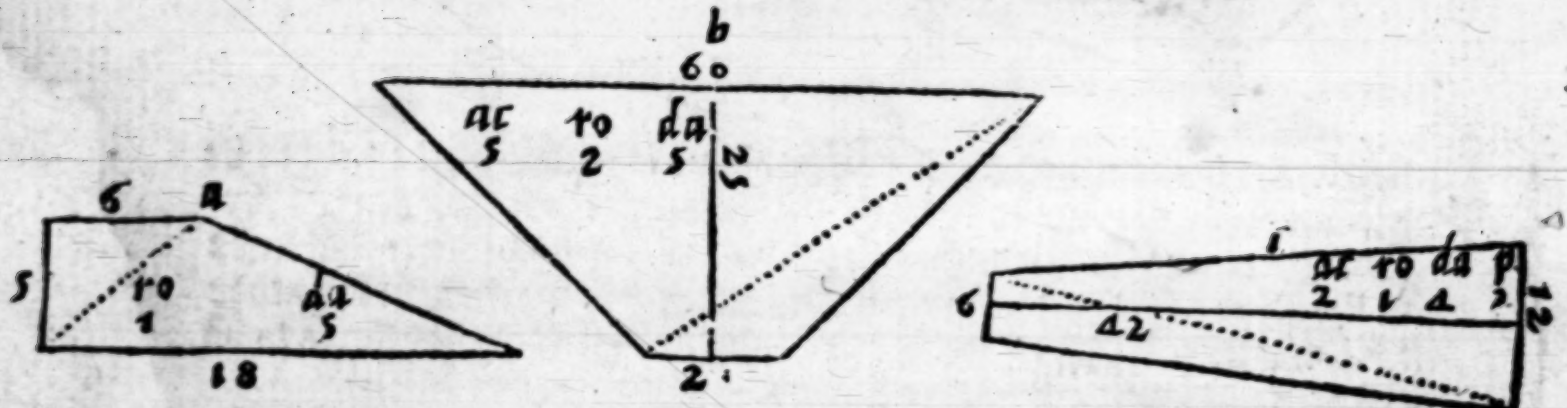
These two fygures folowynge may also be thus measured, otherwise then by the rule of Triangles. Enter your table wyth theyr conueniente lengthe and breadthe. So shall ye fynde the contente of all suche.





These three fygures folowinge, although they may be measured by the rule of Triangles: yet for quicker spede, they haue also their proper measuringe as ensueth.

Laye together the two sydes whiche are parallels of the fyrst fygure a. that is. 6. and 18. makinge. 24. the halfe is. 12. the breadthe. 5. Enter with. 5. and. 12. your table. So haue ye one rode, and fyue dayworkes. For the other two b, c, and suche lyke, ioyne the heades or endes in one: and enter your table with halfe of those pearches, and with the whole number of the middle lyne.



Howe by supputation to measure all Triangled Lande.

To measure triangled lāde bi supputatiō

IOyne all the sydes together: take halfe: out of that halfe pulle euery syde, nothing the difference. Then multiply the differences the one in the other: and the thirde difference augment in the product. That which encreaseth multiply in the halfe of all the sydes ioyned. Then the Radix of the surmontinge summe is the content of that Triangle.

Foure rules folowing.

Nowe reste foure rules to be treated of. The fyrste for all maner regular square Superficies. The seconde for Rounde lande, and her partes. The third for Steples, Columnes, Globes, and theyr parts. The laste for Mountaines and Valleyes. Here they shall in order followe.

A rule

A rule for all maner regular or right squared lande of many sydes, as 5. 6. 7. 8. 9. 10. 20. 100. &c.

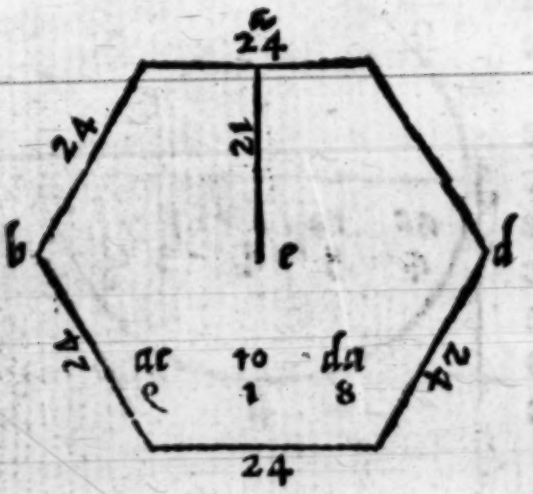
THE IIII. CHAPTER.

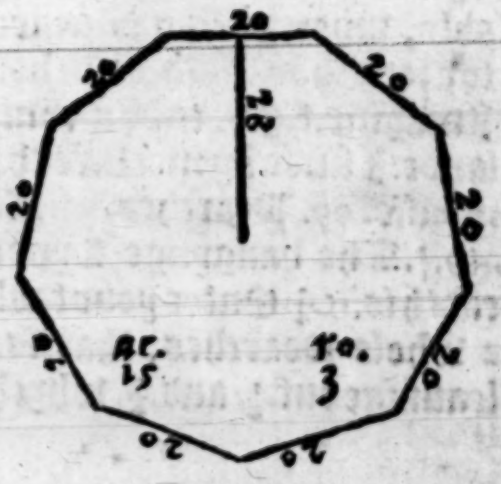
Measure and laye all the sydes together, taking the halfe number of Pearches there conteyned. Then drawe a right hanginge lyne from the centre or myddes of that sygure, to the middes of some one syde. And with that lengthe and the other enter your Table. Note that the Triangle of all sydes like, and the Quadrate sygure, are also measured by this rule. *To measure lande of many sydes.*

Ensample.

Suppose this figure. a. b. c. d. to be a sixesquare pece of land and euery syde. 24. pearches. The halfe summe of all sydes is. 72. pearches: the right hanginge pricked lyne, a. e. 21. Pearches. With these two numbers ye muste enter your table of accompt folowinge hereafter. And dooe as is opened in the declaration there adioined, when numbres surmount the Table, as they do here.

So shall ye finde. 9. Acres. 1. Roode, and. 8. Dayworkes, the contēt of this sygure. a. b. c. d. Euen thus is the other nynesquared sygure measured, and all suche like.





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The Arte of

A rule for rounde Lande, and the partes therof.

The. V. Chapter.

Archimedes in libello circuli mensurationis.

HAlfe the Diametre multiplied in halfe the Circumference sheweth the content of any Circle.

Or thus more playnelye. Ye shal enter your Table wyth halfe ỹ nũber of Pearches of the whole Circumference or compasse, and wyth the number of half the Diametre or breadth. So haue ye the cotente.

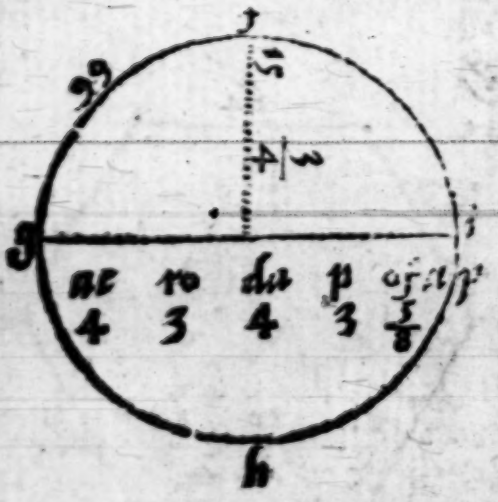
Ensample.

SUppose a piece of lande, wherof the compasse is 100. pearches, the breadth 33. Pearches. I woulde knowe howe muche lande is in this Figure. Enter your Table wyth halfe the compasse that is. 50. and wyth halfe the breadth that is .16. pearches. Because in the table I can not finde 50. for the greatest Lengthe is. 40. (therfore I enter wyth. 40). and. 16. So is founde foure Acres. Then I enter agayne wyth .16. pearches remaynyng and .16. the breadth as before: that bryngeth one Acre. Now to conclude, by addicion of .1. and .4. I finde. 5. Acres in that rounde lande, whose halfe compasse is. 50. pearches. and the breadthe. 16. pearches.

For perfecte knowledge and vse of this Table folowinge, when partes of Pearches are adioyned, note wel this other example that ensueth, & also what is sayd of the declaration annexed vnto the Table, when partes of pearches are in the length, breadth, or in bothe.

How partsof pearches are to be cõpted in measuring.

Imagine. f. g. h. to be a rounde pece of lande: I finde by measure the whole compasse. 99. Pearches. The halfe is. 49. $\frac{1}{2}$. The hangynge Lyne or halfe breadth is. 15. $\frac{1}{2}$. Enter your table wyth the whole Pearches, that is. 49. and 15. leauinge out. $\frac{1}{2}$. and. $\frac{1}{2}$. whyche were but



but parts of pearches. So haue ye. 4. acres. 2. rodes. 3. dayworks, &. 3. Pearches. For those parts of pearches omitted at your first entring the table, worke thus. The halfe pearch, quarter, or other parts of a pearch in the length, must be reckened by them selues in the whole breadth: and those of the breadth cõtrariwise in the length. If there be suche odde partes in bothe, then recken them of the length in the whole breadth, and them of the breadth in the whole length: ioining to the other aforegotten, remembring the product of the one fraction multiplied in thother, to be pulled from the encrease. To make this matter playne, I wyll take this laste ensample before. The one number wherwyth I should haue entred my Table, was. 49. $\frac{1}{2}$. the other. 15. $\frac{1}{4}$. I founde fyrste by entringe with. 49. and. 15. (omitting the odde parts) 4. acres. 2. roodes. 3. Dayworks, and. 3. pearches. Now for the encrease of ỹ partes of pearches left out: I must (as I said) reken them of ỹ length in the breadth, & contrariwise thẽ of ỹ breadth in the length. Half. 15. $\frac{1}{4}$. is. 7. pearches &. $\frac{7}{8}$. Thre quarters of. 49. $\frac{1}{2}$. is. 37. Pearches. $\frac{1}{8}$. Which added, makes. 45. pearches: This adioyned to the number aforegotten, bryngeth the whole content of the rounde fygure, which is. 4. Acres. 3. Roodes. 4. Dayworkes. 3. Pearches. &. $\frac{5}{8}$. of a pearch, the product of the one fraction multiplied in thother subducted. What must be done whẽ ỹ nũbres wherwith ye shold enter excede your table, coũsel ỹ declaration of your table there adioyned.

Of the halfe Circle.

For this half Circle, enter ỹ table with halfe his compasse, & with halfe the Diametre of the circle, or with the lẽgth of ỹ pricked hanginge lyne, k. l. So the content of this half circle, is. 2. acres. 1. roode. 7. dayworkes. 1. Pearch, &. $\frac{13}{16}$. of a pearche.

To measure halfe circled lande.

An other ensample of porcions and partes of a Circle.

Suppose. n. m. o. folowing were a part of a Circle, or pece of land, whose content ye desired. The whole compasse of the Circle whiche this porcion representeth, is (as afore). 99. Pearches: his Diametre or breadth. 31. $\frac{1}{2}$. The pricked arcke or compasse n. m. o. is. 74. Now with the half breadth or semidiametre of the circle. 15. $\frac{1}{4}$. & with. 37. the halfe of the pricked compasse: enter your table. So haue ye. 5. Acres. 2. Roodes, 5. Dayeworkes, 2. Pearches, and. $\frac{1}{4}$. of a

Pearche, the contente of the piece of Lande full of Pryckes, to the sydes of the Triangle pricked.

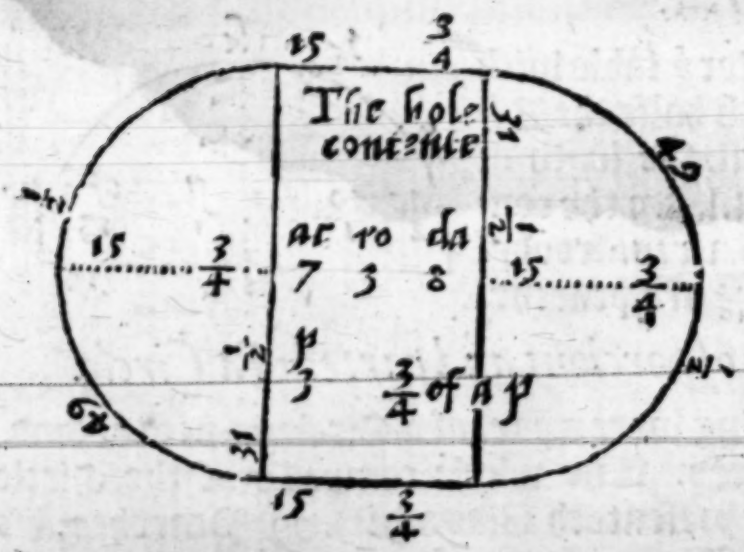
To measure partes of circled lande.

If ye desire to knowe the summe of pearches in thother porcion beneth the Triangle, seperated by the lyne, m.o: ye muste adde the contente of the triangle (whiche is .3. Roodes, and .¼. of a pearch, founde by the rule of Triangles) to the Acres & pearches before searched. So haue ye .4. Acres .1. roode .5. Paylworkes 3. pearches, and .½. of a pearche. This subtracted or pulled from the nunber conteyned in the whole Circle, the remayne is the pearches included in the final pece beneath the Triangle. That is .1. Roode .36. pearches, and .½. of a pearche.

Howe mixed fygures are measured.

Lande compounde of circles or his partes.

I Thinke none nowe will doubt how these two fygures folowinge are measured, because they are made of porcions or partes of Circles, whose measure is before sufficiently opened: the one consistinge of two halfe circles and a Quadrangle: the other beinge the porcion of the Circle, m.o. doubled.



If any euyll fashioned lande chaunce to be measured, whiche requireth to be brought in many triangles, to saue labour, ye may adde some porcion vnto that, and make it square or otherwyse. So let it then be measured: and after frō the product pul away that ye added: the remayne is the content.

To

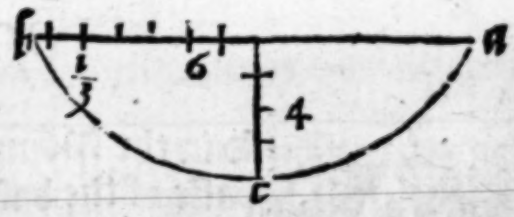
To fynde the content superficiall, of Steples, Columnes, Globes, and theyr partes.

TO the Arithmetician I say. For picked Steples, multiplye the whole syde in halfe the Circumference of the base, addynge the playne of that base. For Pillers augmente the Circumference of the base in the height, puttinge to the playne of both Bases. For Globes, the Diametre in the Circumference multiplied: euen so of Fragmentes or Partes. Let them that be voyde of Arithmetike, enter my Table of accompte folowinge, with suche numbers as I now wylled the Arithmetician to multiplye, not forgetinge what I haue before written: So I serue theyr turne.

To measure Steples, Columnes, Globes, &c.

Or thus, by the rule of proportion, the partes of a Globe are founde.

Suppose. a. b. c. to be a piece of a Globe, and. 4. to be a Portion of the diametre, the whole being. 14. Thus I saye. 14. The whole Diametre geueth. 616. the contente superficiall of this Circle: what shall. 4. bringe: So haue ye. 176. whiche is the content of that pece.



To measure parts of Globes.

To fynde the Diametre by some knowen portion therof.

IF ye be ignorant what lengthe the Diametre of that Globe is whose portion ye haue: the height or parte of the Dimetient being. 4. foote, augment halfe the lyne. a. b, whiche is. 6. ½. in hym selfe, and the product diuide by. 4. So haue ye. 10. to be added to. 4. whiche maketh. 14. the whole Diametre.

To fynde the unknowen Diametre of a Globe.

The true measuringe of Mountaynes and valleyes.

THE VI. CHAPTER.

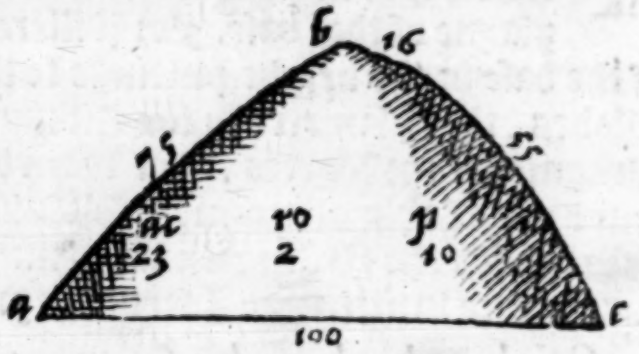
FIrst ye shall measure the circuite of the fote, or base of ỹ Mountaine: then the compasse of the summitie or toppe: adding them together. So shall ye do of the Ascenses, that is, the goinge vp from the foote to the toppe: ioyninge the measure of the longer and shorter in one. Nowe take the halfe of the circuites added, and the halfe parte of the Ascenses ioyned, and enter your Table. There shal ye se the content.

To measure Mountaynes.

Enſample.

A B. C. is the Mountayne: a. c. the circuite of the baſe, beinge 100. Pearches: b. the toppe. 16. Pearches. Whiche ioyned together make. 116. F. c. the one aſcenſe, is. 55. Pearches: the other. 75. Theſe added make. 130. The halfe of the circuites, is. 58. the halfe of the Aſcenſes. 65. Wyth theſe two Summes ye ſhall enter your table of accompt: where ye ſhall finde. 23, acres 2. rodes, and. 10. pearches, the true content of this figured hill.

Figure of a Mountayne.

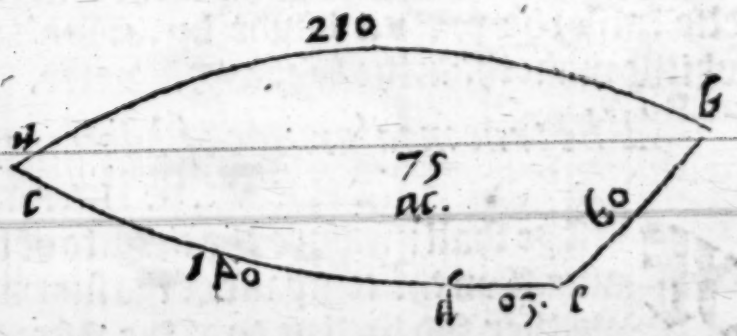


Of the Valley.

To meaſure Valleyes.

AS in the Mountayne ye meaſured the circuite or compaſſe of the baſe or foote: ſo here contrary, ye ſhall meete rounde about the circuite, or compaſſe of the height of the Valley. And as ye gott the meaſure, or compaſſe of the toppe of the Mountayne: ſo meaſure the circuite of the deapth of ỹ Valley. In like maner as ye meaſured the aſcenſe, that is, the goynge vp from the foote to the toppe: ſo meaſure the deſcenſe, or goynge downe of the Hyll to the depth of the Valley. The reſt all worke, as I haue ſhewed in meaſuringe the mountayne.

Figure of a Valley.



For more playnneſſe, beholde this enſãple, or figur. If ye lay together the circuits of ỹ height and depth, whiche is. 210 and. 30. taking the halfe parte of thoſe two circuites, making an. 120. thã the two aſcenſes. 140. ſ. 60, added in one produce. 200. the halfe therof beinge. 100, with this, and. 120. the other halfe of the circuite, ye may enter your table. That doynge, loe. 75. Acres.

Howe

Howe this table of accompte now folowynge is to be vſed

When you haue gotten a conuenient Length & Breadth, (as I haue aboue declared, by dyuers triangles & other figures) then you ſhal enter this table. Seke there the length and moſt number of Perches in the higher margyne, which beginneth at. 1. and endeth rightwarde at 40. Loke thother ſumme of Perches (I meane the Breadth) in the right ſide, & hanging margine, from. 1. deſcendinge to. 30. Nowe at the meting of the lines, where the one anſwereth the other directly in a ſquare, you ſhal finde the Acres, Roodes, Daywoꝛkes & perches. Note that the fyꝛſte number ſet on the left ſide & vpper parte in any ſquare, ſignifieth the number of Acres. The fygure. 1. ſet in the vpper part & right ſide, dothe betoken a Rode: the fygure. 2. there two Rodes. 3. thꝛe Rodes. Any figure in the left ſide beneth, ſygnifyeth a Dayewoꝛke, oꝛ dayewoꝛkes. A fygure in the lower parte ryghteward, declareth Perches.

A declaracion adioyned.

When it chaũſeth that the one number oꝛ both with the which ye ſhould enter this table, are greatter then any here founde: it behoueth you to take the halfe of thone and the hole of the other, oꝛ what partes ye liſt of bothe moſte commodiouſe foꝛ your purpoſe, and ſo enter your table. Loke then what is there founde, and it ſhal beare his name of the partes multiplied in them ſelues.

what is to be done when nũbers (with whiche you ſhulde enter) excede your Table.

Enſample. Suppoſe the number with the which ye ſhould enter your table to be. 103. pearches in Lengthe, and the Breadth. 60. neither of theſe maye be founde in the margynes: wherfoꝛe I take the thirde parte of an. 103. which is. 34. Pearches and. 1. remayneth. The halfe of. 60. that is. 30. I fynde with entryng them at the commune metinge. 6. Acres. 1. Rode, &. 5. Daywoꝛkes. This ſumme muſt haue his name of the partes augmented in them ſelues. I toke the thirde part of the one, and halfe the other number, therfoꝛe. 2, muſt be multiplyed in. 3. oꝛ contrary, ſo haue ye, 6. which ſignifieth that ye haue found by entring, but the firſt part of that number ye ſhuld find Wherfoꝛe I muſt make this ſumme tofoꝛe founde (being. 6. Acres. 1. Rode, and. 5. daywoꝛkes) fiꝛetimes as much. So haue ye. 38. acres & 1. Rode. Foꝛ the Pearche remayning in the Length, recken him in the bꝛeadth, (as is afoꝛe declared) in the. 5. cha. of the remaynes: ſo haue ye. 60. Perches moꝛe to be added. So the encreaſe of theſe two numbꝛes. 103. and. 60. amounteth to. 38. Acres, 2. Rodes, &. 5. dayewoꝛkes. Thus any maner Length and Bꝛeadthe, is reduced to this Table folowyng, which ſuffiſeth.

Loke what I haue shewed in the. 5. chapter of partes, that underſtande here of hole perches left: ſubtracting. &c.

TABVLA

The Table of accompte.

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
5	5 1	5 2	5 3	6	6 1	6 2	6 3	7	7 1	7 2	7 3	8	8 1	8 2	8 3	9	9 1	9 2	9 3		1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
2	2	1	1	2	2	1	1	2	2	1	1	2	2	1	1	2	2	1	1	2	2
1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	3	
5	5 1	6 2	7 1	8	8 3	9 2	1	1	1 3	2 2	3 1	4	4 3	5 2	6 1	7	7 3	8 2	9 1		3
2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	1	
1	2	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9			4
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3 5	6 1	7 2	8 3		1 1	2 2	3 3	5	6 1	7 2	8 3		1 1	2 2	3 3	5	6 1	7 2	8 3		5
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2	1 2	3	4 2	6	7 2	9	2	2	3 2	5	6 2	8	9 2	1	2 2	4	5 2	7	8 2		6
3	3	3	1	1	1	1	1	1	1 1	1 1	1 1	1 1	1 1	1 1	1 2	1 2	1 2	1 2	1 2	1 3	
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									5 2	5 3	6	6	6 1	6 2	6 3	7	7 1	7 2			
									5	2 2	7	2	5	2 2	9	3	8	3			

THus with fewe woordes is ended the certayne measurynge of all maner Lande, towchynge theyr superficiall contentes. Wherfore nowe shall folowe the trewe measuring of tymbre, Stone, Steples, Pyllers, Globes, accordyng to theyr Crassitude.

To the Reader.

IT cometh communely to paſse that Carpenters, Maſons, and ſuch like Artificers are put eyther to meaſure Timber euery waye ſquare, or squared logs, broader on thone, thē on thother ſyde, yea many tymes mutilate or vnperfecte ſtuffe: ſome tymes .3. 5. 10. or, 20, ſquare in the heade and ſo throughe, oftentymes rounde ſtone or tymber, with hollowed. &c. Afore I ſhewe vnto them what muſte be done with ſuche peces of Tymber or ſtone to gette theyr true meaſure, my deſire ſhall be, that ſuche Crafteſmen will leaue to be heady or ſelfwilled, yea ſo gredily to sticke to theyr olde corrupted rules that vtterly they refuſe to be taught.

Both learninge & experience declareth vnto me, that ỹ groundes whiche the beſt of them haue are falſe. To open howe and where, it nedeth not: neyther doeth it apperteine to inſtruction. Only it mays ſuffice hym that liketh the true way, here to receyue it appointed to him. Yet to ſatiſfie and content him whiche wil not beleue any ſuch errours or falſe groundes to be: I ſay (and truelye) that the Ruler of tymber meaſure, which the more parte of them hath, is not made by right arte. Beſydes that theyr craft in ſeekinge the ſquare of ſome tymber, is very falſe. They vſe in meaſuring to lay the broader and narrower ſydes together in a ſumme: and to take the halfe of that number for the ſquare. Then they ſeke this vntrue ſquare vpon the falſe ruler: and ſo meaſuringe the tymber, they conclude of it vntruly. As this is corrupted, ſo are other groundes which they take to be infallible. Now to the purpoſe, touchinge the correction of thoſe errours with other not mencioned, wherby true meaſuringe may enſue this way ſhall be taken. After I haue opened how ye muſt handle all ſuch faſhioned tymber (as afore is ſpoken of) there ſhall folowe a table, in whiche ye may fynde (as I will declare) the ſquare of any ſtone, or tymber. That knowen, it is requiſite to haue an other table immediatly folowinge, whiche may appoint to all true ſquares, from .1. to .6. inches, the iuſt lengthe to make a Foote euery waye ſquare. With that length agreable to your ſquare, your logge muſt be meaſured. And as oft as ye finde it from the one ende to thother of your tymber, ſo oft ye may conclude the foote ſquare to be conteyned

In a foote ſquare is conteined 1728. Inches.

ned in that tymber logge, or stone: that is, so many square fete there to be included. This Table of tymber measure standeth in the place of a good Ruler, well decked with true measures. By this ye maye make or correct rulers at pleasure, as after appeareth.

Nowe orderly foloweth the true measuringe of all fashioned Tymber or Stone afore named.

Howe tymber or stone, foure square euery way, or broader on the one then on the other syde, is measured.

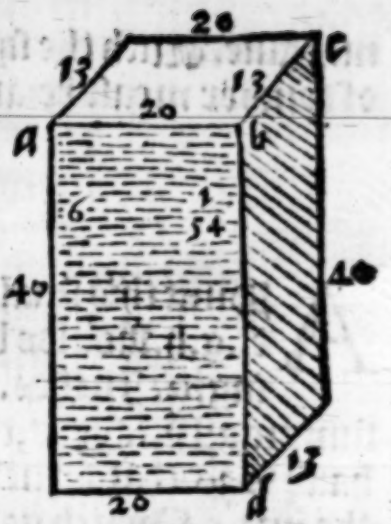
THE VII. CHAPTER.

IF a pece of Timber, or Stone be ether equally square, or broader on the one syde then on the other, ye shall take the iuste measure, I meane howe many Inches the broader syde conteyneth: euen so of ỹ narrower. This done ye must seke in the table of squares folowing, the measure of the broader syde of the tymber or stone, in the vpper margyne of that table. Then looke for the number of Inches of the equall or narrower syde, in the right part ỹ hanginge margyne. At the commune metinge, where the one number answereth directlye to the other, there your true square shall appeare. This square so founde shall be referred to your table of tymber measure: in ỹ which ye may playnely see (yf you runne downe by the left margine, vntyll your Inches square appeare) howe many fete or Inches of your ruler belongeth to a foote square. As oftẽ as that measure there founde is conteyned in the tymber or stone, so often and as many fete square ye may conclude (without doubt) that pece of timber or stone to haue.

Ensample.

SUppose this squared Tymber or Stone, a. b. c. d. were to be measured, the broader syde, a b, 20. Inches: the narrower syde. b. c. 13. ynches: the lengthe. 40. ynches. Nowe I muste seke the broader syde. 20. in the vpper margyne of the

of the table. The narrower ſyde .13. muſt be founde in the right ſyde and hanginge margine. At theyr cõmon metyng 16. inches, and .$\frac{1}{3}$. part of an Inche ſhall appeare. This true ſquare muſte be ſearched for in the Table of tymber meaſure. Therfore loke for .16. in the margine of that Table. In the ſquares with him rightwarde, ye ſhal fynde .6. Inches, and .$\frac{1}{4}$. which is thre quarters of an inche. Somedele leſſe of your ruler then .6 and .$\frac{1}{4}$. layed out vpon the Tymber, maketh a fote ſquare. And that meaſure ſo diſcretely handeled, is conteined in the lengthe of your tymber .iii. tymes. Wherefore affirme .iii. fote there to be, beſyde that is left .$\frac{1}{54}$. parte of a foote. Note becauſe the ſquares, at al tymes (as in this enſample) ryſe not to euen Inches, but ſometyme to odde partes: Therfore accordinge to your diſcrecion, adde or take away ſome part more or leſſe in ſetting forth the fote ſquare, as aboue is parformed.



It were intollerable tediouſnes, yea impoſſible, to ſette forth ỹ true quantities of tymber meaſure, to all odde quantities of ſquares. The diſcrete handlinge of theſe, the wyttie ſhall bringe to a ſufficient exactneſſe.

Of Tymber or Stone. 3. 5. 10. 20. or mo ſides ſquare. &c.

THE VIII. CHAPTER.

When Tymber hathe diuerſe equall ſquares in the heade and ſo through: fyrſt meaſure all the ſquare ſydes round about the heade or ende of the Timber. Then take halfe the number of that whole meaſure for thone Breadthe. Then meaſure from the Centre (which is the middle of the heade, or ende of the Tymber) to the myddes of one ſquare ſyde, betwene the two angles: and take the meaſure of that diſtance for the other Breadth. Nowe reſorte wyth the meaſures of theſe two breadthes (as tofore) to the Table of ſquares: ſeking the bigger number or breadth in the vpper margyne, and the other leſſe in the ſyde margine

margine. With the square there founde, haue recourse to the table of tymber measure: and do as I haue instructed.

Ensample.

ADmit this smal pece of tymber .5. square. e. f. g. h. shoulde be measured, euery syde being .12. Inches. If ye adde together in one summe all ỹ .5. sydes, they make .60. Inches. The halfe is .30. that serueth for one Breadth. Then the line .e.f. which goeth from the Centre or middes of the square to the middle of one syde, is. 8. Inches. The two numbers .30. and .8. muste be sought (as afore) in the table of squares folowing. At the commune metinge, your square shall appeare .15. Inches and .½. This square .15. seke in the table of tymber measure. There ye may se right with it .7. Inches, and .¾. Nowe because of .½. the odde quantitie of the square aboue .15. Inches, lay sometyme lesse. Then se howe oftentymes that measure (so with discretion handled) is from the one ende of your tymber to the other: and affirme so many tymes a foote square there to be, as that measure is founde in the lengthe of your logge.

Howe rounde and hollowed Tymber, Steples, Pillers, Globes. &c. are to be measured.

THE IX. CHAPTER.

FIrst gyde the logge rounde about with some lyne: then diuide the lyne, whiche compassed that tymber, in two equal partes, kepe the one part for the bygger Breadthe: After ye shall diuide againe that whole length (the twenty and two parte cast away) in thre partes, and take the halfe of one of them for the other narrower Breadth. With the measures of these two breadthes, haste to your table, performing all thing as afore is opened.

Enter

Enſample.

SUppoſe this little piece of Tymber. i. k. l. m. were to be meaſured, the compaſſe or gyrdinge 36. ynches, the halfe of that is, 18. beinge the one Breadth: then the thyrde parte of. 36. is. 12. the halfe of it is. 6. whiche is the other narrower breadth. With theſe two numbers. 6. and. 18. enter the Table of ſquares folowinge, and ſo the Table of Tymber meaſure. At the laſte (all thinges performed as before) ye ſhall fynde in this rounde logge, (the lengthe. l. m. being. 18. ynches). 1. foote and. ⅛. parte of a foote. This is ſufficient for all ſuche lyke.

A note of hollowed Tymber.

IF it chaunce that hollowed Tymber be to be meaſured: meaſure the whole logge as though it were not hollowe, as aboue is declareth. Then meaſure the narrower and broader ſyde of the hollowe: and ſee what is conteyned in that, as though it were maſſy Tymber. Nowe pulle out the content of it, from the whole aboue meaſured: the remayne of force muſte ſhewe what tymber is included in that hollowed body.

I Am vnable in few woordes to expreſſe to the vnlearned, by what meane Pyramidal, or picked regular Steples of all faſhions are meaſured. Alſo how Pyllers: how the content of Globes or Bowles are ſearched: vnleſſe the arte of numbringe were taſted. That beinge knowen: thus (as nowe foloweth) I teache.

Howe the Craſſitude of picked Steples is knowen.

MUltiply the playne of the Baſe in the thirde part of ỹ height: ſo ye haue the Craſſitude. Or multiply the content ſuperficiall (founde as I haue inſtructed) in the height of the Steple,

takinge for your purpose the thyrde parte of that product.

Howe the content of Pillers is knowen.

Increase the base playne in his altitude or height: so haue ye your desyre.

Howe the Cubicall bodyes of Globes are searched.

The content superficial founde (as I haue opened) must be multiplyed in the fyrste parte of the Diametre: the product is that ye requyre. Or the thyrde parte of the Superficiall contente in half the Diametre. Or multiple the plaine of the Circle in the whole Diametre: then take two thyrde partes, which added make the crassitude.

Of the halfe Circle.

His superficial content multiplied (as is sayd) bringeth the magnitude of him. If any man require ensãples of this laste matters, or more sufficient handlynge: let them resorte vnto my bokes published of Geometrye, there they shall be satysfyed. These little apperteyn to Carpenters or Masons, therfore not by ensample declared.

A generall Note.

When thou shalt be put to measure some body without order or fashion, lackinge part of his square, or hauing more then his forme: if it lacke thou shalt make it perfect by obseruing diligentlye the runninge together of the sydes. The partes wantinge shall be measured as though they were there, whiche portions muste be taken from the whole body measured.

Also when there resulteth any more then the forme or regulare square: fyrste measure the square body: then the crassitude whyche aboundeth. All put together do shewe the whole irregular bodye. This suffyseth.

A table

A table to fynde the iuſt Radix or Square of any Tymber, or Stone.

IT behoueth you to knowe that this Table folowinge is made for the true ſquare of any maner Timber. Therfore vnderſtande that the numbers from. 1. to. 40. ſet aboue in the hyghe Margyne betoken the Inches of the broader ſide of the timber. And the numbers from. 1. and ſo downeward to. 30. put in the right part and hanging margine of this Table, ſignifie the ynches of the narrower ſide: and to conclude briefly, the elementes or figures ſet in euery ſquare roume betoken the iuſte ſquare. The bygger ſigures leftwarde in euery ſquare place, ſignifie the whole ynches. And the other leſſer ryghtewarde in the ſame ſquare diuided by a lyne, the partes of ynches, as $\frac{1}{2}$ $\frac{2}{5}$ &c.

This firſte fraction toward the lefte hande betokeneth one halfe parte of an ynche: thother two fyftes of an ynche: and euery fygure or fraction, hauinge a pointe adioyned vnto him, ſomdeale leſſe then the parte is: as this parte $\frac{1}{2}$ repreſenteth ſcante halfe an ynche, a very little quantitie leſſe. And if he had two pryckes by him, he ſhould haue declared ſome quantitie more: as this other fraction or parte. $\frac{2}{5}$ whiche is more than two fiftes, a ſmale deale.

It had not bene nedefull to haue put the partes of the ſquare ſo preciſely as they are here: neyther is it requiſite ſo curiouſly to take them.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	1 3/7	1 3/4	2	2 1/4	2 1/2	2 3/5	2 4/5	3	3 1/7	3 1/3	3 1/2	3 4/7	3 3/4	3 7/8	4	4 1/8	4 1/4	4 1/3	4 1/2	4 3/5	4 6/9
	2	2 2/5	2 4/5	3 1/6	3 1/2	3 3/4	4	4 1/4	4 1/2	4 2/3	5	5 1/10	5 1/4	5 2/5	5 5/8	5 4/5	6	6 1/7	6 1/3	6 1/2	6 2/3
		3	3 1/2	3 6/7	4 1/4	4 5/8	5	5 1/5	5 1/2	5 3/4	6	6 1/4	6 1/2	6 3/5	7	7 1/8	7 3/8	7 1/2	7 3/4	8	8 1/8
			4	4 1/2	5	5 1/4	5 2/5	6	6 1/3	6 2/3	7	7 1/5	7 1/2	7 3/4	8	8 1/4	8 1/2	8 3/4	9	9 1/6	9 1/3
				5	5 1/2	6	6 1/3	6 3/4	7 1/14	7 3/7	7 3/4	8 1/16	8 3/8	8 3/5	9	9 2/9	9 1/2	9 7/9	10	10 1/4	10 1/2
					6	6 1/2	7	7 1/3	7 3/4	8 1/8	8 1/2	8 5/6	9 1/6	9 1/2	9 5/6	10 1/10	10 2/5	10 2/3	11	11 1/4	11 1/2
						7	7 1/2	8	8 3/8	8 4/5	9 1/6	9 5/9	9 8/9	10 1/4	10 3/5	10 9/10	11 1/6	11 1/2	11 6/7	12 1/8	12 2/5
							8	8 1/2	9	9 1/3	9 4/5	10 1/5	10 3/5	11	11 1/3	11 2/5	12	12 1/3	12 2/3	13	13 1/4
								9	9 1/2	10	10 2/5	10 4/5	11 1/4	11 3/5	12	12 3/8	12 3/4	13 1/13	13 2/5	13 3/4	14 1/16
									10	10 1/2	11	11 2/5	11 3/4	12 1/4	12 2/3	13 1/32	13 3/8	13 4/5	14 1/8	14 1/2	14 6/7
										11	11 1/2	12	12 5/12	12 3/4	13 1/4	13 2/3	14 1/16	14 1/2	14 4/5	15 3/16	15 1/2
											12	12 1/2	13	13 2/5	13 4/5	14 2/7	14 5/7	15 1/10	15 1/2	15 6/7	16 1/4
												13	13 1/2	14	14 3/7	14 5/6	15 1/3	15 3/4	16 1/8	16 1/2	17
													14	14 1/2	15	15 2/5	15 7/8	16 5/16	16 3/4	17 1/7	17 1/2
														15	15 1/2	16	16 7/16	16 7/8	17 1/3	17 3/4	18 1/8
															16	16 1/2	17	17 3/7	17 7/8	18 1/3	18
																17	17 1/2	18	18 1/3	18 7/8	19
																	18	18 1/2	19	19 2/5	19
																		19	19 1/2	20	20
																			20	20 1/2	21
																				21	21
																					22

The Table of Squares

RADICVM

22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
4 3/5.	4 6/9	4 3/4	5.	5	5 1/10	5 3/16	5 1/3	5 2/5	5 1/2.	5 1/2.	5 5/8	5 3/4	5 9/10	5 7/8	6	6 1/16.	6 1/8	6 1/4	6 1/3.	1
6 1/2.	6 2/3	6 5/6	7.	7 1/16	7 3/14	7 3/8	7 1/2	7 3/5.	7 3/4	7 7/8	8	8 1/8	8 1/4	8 3/8	8 1/2	8 5/8.	8 3/4.	8 7/8.	9.	2
8.	8 1/8	8 5/16	8 1/2.	8 2/3	8 7/8	9	9 1/6.	9 1/3	9 1/2	9 2/3.	9 4/5.	10.	10 2/10	10 1/4	10 2/5	10 1/2	10 5/7	10 4/5.	11.	3
9 1/6	9 1/3.	9 1/2.	9 3/4	10	10 1/5	10 2/5	10 3/5	10 4/5.	11.	11 1/8	11 1/3	11 1/2.	11 3/5	11 4/5.	12	12 1/6	12 1/3	12 1/2	12 2/3.	4
10 1/4.	10 1/2	10 3/4	11.	11 1/6	11 1/3.	11 1/2	11 3/4.	12 1/24	12 1/4	12 1/2	12 2/3	12 4/5.	13 1/26	13 2/9	13 3/8.	13 1/2	13 4/5.	14.	14 1/7.	5
11 1/4	11 1/2	11 3/4	12	12 1/4	12 1/2	12 3/4	13.	13 1/5.	13 3/7	13 2/3.	13 5/6	14 1/14	14 2/7	14 1/2	14 5/7	15.	15 1/10	15 1/3.	15 1/2	6
12 1/8	12 2/5	12 2/3.	13.	13 1/4	13 1/2	13 3/4	14	14 1/4	14 1/2	14 3/4	15.	15 1/5	15 2/5.	15 2/3.	15 6/7	16 1/12	16 1/3	16 1/2	16 3/4.	7
13.	13 1/4	13 1/2.	13 5/6	14 1/7	14 3/7	14 2/3	15.	15 1/4.	15 1/2.	15 3/4	16	16 1/4	16 1/2.	16 3/4	17.	17 1/5	17 3/7	17 3/5.	17 6/7.	8
13 3/4	14 1/16	14 1/3.	14 5/7	15	15 1/4.	15 2/3	15 7/8	16 1/7	16 2/5.	16 3/4.	17.	17 1/4	17 1/2.	17 3/4	18	18 1/4	18 1/2	18 3/4	19.	9
14 1/2.	14 6/7	15 1/6	15 1/2.	15 4/5	16 1/8	16 2/5	16 3/4.	17 1/32	17 1/3.	17 3/5	17 7/8.	18 1/6.	18 1/2.	18 2/3	19.	19 1/4	19 1/2.	19 3/4	20	10
15 3/16	15 1/2.	15 6/7.	16 1/4	16 3/5.	16 7/8.	17 1/4.	17 1/2.	17 6/7	18 1/6	18 1/2.	18 3/4	19 1/16	19 1/3	19 5/8	19 6/7	20 1/6	20 3/7	20 3/4.	21.	11
15 6/7	16 1/4	16 5/8.	17.	17 1/3.	17 2/3.	18	18 1/3.	18 2/3	19.	19 1/4.	19 2/3.	19 8/9	20 1/5.	20 1/2.	20 4/5.	21:	21 1/3	21 2/3.	21 8/9	12
16 1/2.	17.	17 1/4.	17 3/5.	18 1/32	18 3/8	18 3/4.	19 1/16.	19 3/7	19 3/4	20 1/16	20 2/5.	20 3/4	21 1/32	21 1/3.	21 5/8	22.	22 1/5	22 1/2.	22 3/4.	13
17 1/7	17 2/16	18.	18 1/3	18 3/4	19 1/14	19 3/7	19 5/6	20 1/7	20 1/2.	20 7/8.	21 1/7	21 1/2.	21 4/5	22 1/8	22 1/2.	22 3/4	23 1/16	23 3/8.	23 5/8.	14
17 3/4	18 1/6	18 3/5.	19.	19 3/8	19 3/4	20 1/8	20 2/4	20 7/8.	21 1/5	21 5/9	21 9/10	22 1/4	22 5/8	22 7/8.	23 1/4	23 3/5.	23 7/8	24 1/5.	24 1/2.	15
18 1/3	18 7/9	19 1/6	19 5/8	20	20 2/5	20 4/5	21 1/6	21 1/2.	21 7/8.	22 1/4.	22 5/8	23.	23 1/3.	23 5/8.	24	24 1/3	24 2/3.	25.	25 1/4.	16
18 7/8	19 1/3	19 3/4.	20 1/6	20 5/8	21 1/32	21 2/5	21 5/6	22 1/5	22 3/5.	23.	23 1/3	23 3/4	24 1/32	24 3/7.	24 3/4	25 1/13	25 2/5	25 3/4	26 1/16	17
19 2/5	19 7/8	20 1/3	20 3/4.	21 1/5	21 5/8	22 1/32	22 1/2.	22 3/4.	23 1/4	23 5/8	24	24 3/8	24 3/4	25 1/10	25 1/2	25 3/4.	26 1/7	26 1/2.	26 3/4.	18
20.	20 1/2	20 2/10	21 1/3	21 3/4.	22 1/4	22 5/8.	23 1/16	23 1/2.	23 7/8	24 1/4.	24 2/3.	25 1/32	25 1/3.	25 3/4	26 1/7	26 1/2.	26 7/8	27 1/5	27 1/2.	19
20 1/2	21.	21 3/7	21 8/9	22 3/8.	22 4/5	23 1/4	23 2/3	24 1/16.	24 1/2.	24 5/6.	25 2/7	25 2/3	26 1/13.	26 1/2.	26 4/5	27 1/5	27 1/2.	27 7/8.	28 2/7.	20
21	21 1/2.	22.	22 1/2.	22 7/8.	23 1/3.	23 4/5	24 1/4.	24 2/3	25 1/10	25 1/2.	25 8/9.	26 1/3.	26 3/4	27 1/9	27 1/2.	27 7/8	28 1/4.	28 5/8	29.	21
	22	22 1/2.	23.	23 1/2.	23 7/8.	24 3/8	24 5/6.	25 1/4.	25 3/4	26 1/8	26 1/2.	27.	27 1/3.	27 3/4	28 1/7	28 1/2.	28 7/8.	29 1/4.	29 5/8	22
		23	23 1/2.	24.	24 1/2.	24 7/8.	25 1/3.	25 7/8.	26 1/4.	26 3/4	27 1/8	27 1/2.	28.	28 3/8	28 3/4.	29 1/6	29 3/5.	30.	30 1/3.	23
			24	24 1/2.	25.	25 1/2.	25 7/8.	26 3/8	26 4/5	27 1/4.	27 3/4	28 1/7	28 1/2	29.	29 3/8	29 4/5	30 1/5.	30 3/5.	31.	24
				25	25 1/2.	26.	26 1/2.	26 7/8.	27 3/8.	27 4/5.	28 1/4.	28 3/4	29 1/6	29 3/5	30	30 1/3	30 4/5	31 1/5	31 5/8	25
					26	26 1/2.	27.	27 2/5.	27 4/5.	28 3/8	28 3/4.	29 1/3	29 3/4.	30 1/7	30 1/2.	31:	31 2/5.	31 7/8	32 1/4.	26
						27	27 1/2.	28.	28 1/2	28 7/8.	29 2/5	29 4/5.	30 1/4.	30 3/4.	31 1/6.	31 3/5	32 1/32	32 1/2.	32 7/8	27
							28	28 1/2.	29.	29 1/2	29 7/8	30 1/3	30 7/8	31 1/4	31 3/4	32 3/16	32 5/8	33 1/32	33 2/5.	28
								29	29 1/2.	30.	30 1/2.	30 7/8	31 3/8	31 7/8	32 5/16	32 3/4.	33 1/5.	33 5/8	34 1/16.	29
									30	30 1/2.	31.	31 1/2.	32.	32 3/8	32 7/8	33 1/3.	33 3/4.	34 1/5.	34 5/8	30

Foote	Inches	Parters
1	144	
2	36	
3	16	
4	9	
5	5	9
6	4	
7	2	11
8	2	3
9	0	21
10	17	
11	14	
12	12	
13	10	
14	8	
15	7	
16	6	
17	6.	
18	5	
19	4	
20	4	
21	3	
22	3	
23	3	
24	3	
25	2	
26	2	
27	2	
28	2	
29	2	
30	1	
31	1	
32	1	
33	1	
34	1	
35	1	
36	1	

The table of Tymber meaſure, with the declaration and uſe of it.

THE, X. CHAPTER.

THis Table (as ye ſee) is deuyded into twoo columes or rowes: the one very ſhorte, the other longer.
In the headde of the fyrſte I haue put this woord Fote in the ſeconde rowe Inches and partes: to ſignifie feete, inches, and partes of inches.
The ſummes in the margyne and leſte parte of the fyrſte and ſeconde colume, declare the quantitie of the ſquare of timber or ſtone, from. 1. to. 36. inches ſquare. Within the rowes you maye fynde the iuſt lengthe to a foote ſquare, if ye enter into them in ryght order, accordynge to the ſquare

Enſample.

SUppoſe the ſquare of your tymber were. 7. ynches, and that ye deſyred to know what meſure or length of the ruler wolde make a foote ſquare. Seke in the leſte margyne. 7. ynches: and with him in that order towarde the righte hande, ye ſhal find 2. foote. 11. ynches, & $\frac{2}{7}$ of an ynche. Note becauſe the fractiõ $\frac{2}{7}$. hath a pricke by hym, it betokeneth ſome ſmall quantitie leſſe then $\frac{2}{7}$ of an ynche. If it hadde twoo prickes or poyntes thus: $\frac{2}{7}$ it ſhoulde ſignifie ſome lyttel quantitie more. Neither maketh it matter, whether ye obſerue this prickynge or noo, the quantitie is ſo lyttel to be added or pulled awaye.

Note what hathe ben ſpoken of Tymber, the ſame alſo is to be vnderſtande of ſtone, lyke wyſe to be meaſured.

¶ Thus is finyſhed the meaſuryng of timber, nowe enſueth of Bourde. &c.

How

Tables, Borde, or Glaſſe.

Howe Tables, Bordes, Glaſſe, or any ſuch like are meaſured, accordinge to theyr length and breadth onely to the foote ſquare.

THE XI. CHAPTER.

THis thing is perfo3med by ỹ helpe of a large table folowing, diuided in fiue ſmal tables, and as many margines The fy3ſt and left marigne beginneth at. ¼. whiche is one quarter of an ynch, and extendeth to .6. Inches, as ye may playnely perceyue yf ye runne downe by that margyne. This hath his Table on the ryghte ſyde adioyninge vnto him. The other taketh his begynninge at. 6. ynches. ¼. and endeth at. 12. hauyng his p3oper table alſo. The thy3de, from. 12 ¼ to. 18. And ſo from. 18. ¼. to. 24. From 24 ¼. to. 30 The laſte margine is from. 30. ¼ to. 36, and there endeth.

Of this that is ſayd, you may gather that euery margine hath his Table on his ryght ſyde. Alſo you muſte knowe that in the top and beneth I haue put (as in the table of Tymber meaſure) theſe wo3ds, fote, ynche, and partes, to ſygnify fete, ynches, and partes of an ynch. Whenſoeuer ye lyſte to meaſure, Bo3de, Glaſſe, o3 any other ſuche, with the b3eadth of it enter this Table: and ſeeke that b3eadth in his p3oper margine. There ye ſhall fynde in right o3der how many fete, ynches, o3 partes, of an Inche belonge to a foote ſquare. So often as the meaſure is in your ſtuffe, juſt as many fete haue ye in that bo3de o3 ſuche lyke. If the b3eadth ercede this Table: than diuide ỹ b3eadth in partes and wo3ke as is and ſhall be declared. So the ingenious applyeth this Table fo3 all maner b3eadthes moſte exactly.

Enſample.

SUppoſe I haue a pane of Glaſſe, o3 a bo3de, whoſe b3eadthe were 22. ynches. ¼. the length. 16. fote. In the fourth margin I finde this b3eadthe. 22. and ¼. And euen with it in the Table rightward I ſe 6. ynches. ⅓. So much of my ruler (wanting ſome ſmall quantity) maketh a foote. Nowe, becauſe in the lengthe of my bo3de (whiche is 16. foote) that meaſure is founde. 29. tymes, and. ⅓. partes. I concluded. 29 foote ther to be, & two thy3de partes of a foote ſquare, acco3dinge to

Fo Yn			Fo Yn			Yn Par		Yn Par		Yn Par	
1/4	48		6 1/4	1	11 1/25	12 1/4	11 3/4	18 1/4	7 7/8	24 1/4	5 15/16	30 1/4	4 3/4
1/2	24		6 1/2	1	10 1/7	12 1/2	11 1/2	18 1/2	7 4/5	24 1/2	5 7/8	30 1/2	4 5/7
3/4	16		6 3/4	1	9 1/3	12 3/4	11 2/7	18 3/4	7 2/3	24 3/4	5 4/5	30 3/4	4 2/3
1	12		7	1	8 4/7	13	11 1/16	19	7 4/7	25	5 3/4	31	4 5/8
1 1/4	9	7 1/5	7 1/4	1	7 7/8	13 1/4	10 7/8	19 1/4	7 1/2	25 1/4	5 2/3	31 1/4	4 5/8
1 1/2	8		7 1/2	1	7 1/5	13 1/2	10 2/3	19 1/2	7 3/8	25 1/2	5 5/8	31 1/2	4 4/7
1 3/4	6	10 2/7	7 3/4	1	6 4/7	13 3/4	10 1/2	19 3/4	7 2/7	25 3/4	5 5/8	31 3/4	4 1/2
2	6		8	1	6	14	10 2/7	20	7 1/5	26	5 1/2	32	4 1/2
2 1/4	5	4	8 1/4	1	5 3/7	14 1/4	10 3/32	20 1/4	7 1/8	26 1/4	5 1/2	32 1/4	4 1/2
2 1/2	4	9 3/5	8 1/2	1	4 15/16	14 1/2	9 7/8	20 1/2	7 1/32	26 1/2	5 3/7	32 1/2	4 3/7
2 3/4	4	4 3/8	8 3/4	1	4 3/7	14 3/4	9 3/4	20 3/4	6 15/16	26 3/4	5 3/8	32 3/4	4 3/8
3	4		9	1	4	15	9 5/8	21	6 6/7	27	5 1/3	33	4 1/3
3 1/4	3	8 1/3	9 1/4	1	3 4/7	15 1/4	9 3/7	21 1/4	6 4/5	27 1/4	5 2/7	33 1/4	4 1/3
3 1/2	3	5 1/8	9 1/2	1	3 1/7	15 1/2	9 2/7	21 1/2	6 5/7	27 1/2	5 2/9	33 1/2	4 2/7
3 3/4	3	2 2/5	9 3/4	1	2 3/4	15 3/4	9 1/8	21 3/4	6 5/8	27 3/4	5 1/5	33 3/4	4 1/4
4	3		10	1	2 2/5	16	9	22	6 1/2	28	5 1/8	34	4 1/4
4 1/4	2	9 7/8	10 1/4	1	2 1/21	16 1/4	8 6/7	22 1/4	6 1/2	28 1/4	5 3/32	34 1/4	4 3/16
4 1/2	2	8	10 1/2	1	1 3/4	16 1/2	8 3/4	22 1/2	6 3/8	28 1/2	5 1/16	34 1/2	4 1/6
4 3/4	2	6 1/3	10 3/4	1	1 3/8	16 3/4	8 5/8	22 3/4	6 1/3	28 3/4	5	34 3/4	4 1/8
5	2	4 4/5	11	1	1 1/11	17	8 1/2	23	6 1/4	29	4 7/8	35	4 1/8
5 1/4	2	3 3/7	11 1/4	1	4/5	17 1/4	8 1/3	23 1/4	6 1/5	29 1/4	4 7/8	35 1/4	4 3/32
5 1/2	2	2 1/5	11 1/2	1	1/2	17 1/2	8 1/5	23 1/2	6 1/8	29 1/2	4 7/8	35 1/2	4 1/16
5 3/4	2	1 1/23	11 3/4	1	2/7	17 3/4	8 3/32	23 3/4	6 1/16	29 3/4	4 5/6	35 3/4	4 1/32
6	2		12	1		18	8	24	6	30	4 4/5	36	4
Fo Yn			Fo Yn			Yn Par		Yn Par		Yn Par		Yn Par	

that length and breadth. I sayde (wantinge some small quantitie) because of the poynte ioyned to this fraction ⅔. whiche is put to diminish that fraction some little thinge, as is declared playnely in the other tables before put forthe.

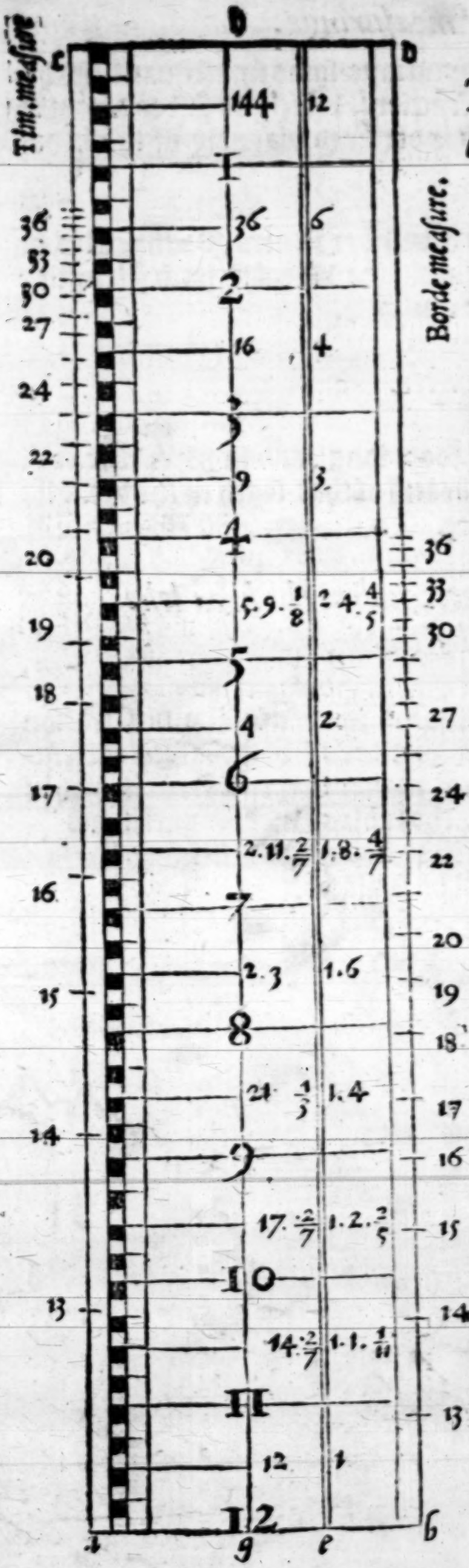
He that desyreth to measure Chamber floores, Pauimentes, or such lyke: let him onely multiply the Breadth with ỹ lengthe: so the produste sheweth the contente.

Ensample.

If there were a Pauement. 100. foote long, and in Breadthe. 50. I must nedes conclude (by multiplicaciō of that lēgth in the breadth) there to be conteyned. 5000. foote.

Or thus without Arithmetike when the breadthe exceadeth the Table.

Diuide the breadthe in partes (as is opened in the declaration of the Table of accompt) and worke as I haue before instructed. So for Pauementes all maner wayes it serueth youre turne. Of this matter to put forthe tables, were superfluous tediousnes and follye. The ingenious with these fewe, will be satisfyed.



The Carpenters Ruler.

The face of the Carpenters ruler, figured with the true measures and other thinges necessary.

THE XII. CHAPTER.

BEcause the effect of this Ruler is aboue declared by Tables, an Instrument also wel knowen and commune amonge good Artifycers: I will not spende many woordes, in opening it. Beholde the fygures, and learne by them howe ye ought to make, and commonly to decke youre Ruler, bothe with Tymber and bourde measure.

Ensample.

ADmit the ruler to be. a. b. c. d. wel playned, twelue Inches longe, a quarter of an Inche thicke, and two Inches yn breadth. Truly yt were more commodious, if it hath two foote in length. This ruler here imagined but a fote in length, is dimded fyrst in twelue euen partes, called Inches: then euery Inche in halfe, or two equall porciõs: ech half in two quarters: euery quarter in four or two partes at the leest: as in this ensample. Then are the fygures placed from. 1. to. 12. manifestinge the ynches. Thus your Ruler is ready to receaue the measures which are marked or fygured on your Ruler thus. And fyrst the Tymber measure as foloweth.

Ye shall resorte to youre Table of Tymber measure, and seeke howe many fete belonge to.1. Inche square: there ye shall fynde.144. This number note, write, or rather graue, where this fygure.1. representinge one inche, is fygured as ye may se in the middes betwene the lyne.e.f. and the line of the fygure.g.h. This done. resorte to your Table agayne, and beholde howe many fote and partes.2. Inches square requireth. So shall ye fynde.36. foote, whiche is placed in the next roume leftwarde, vnder the characte re.2. fygnifying two ynches. Thus of the reste, fete, Inches, and partes, founde in youre Table, vntyll you come to the.12. Inche, where ye shall perceyue.12. Inches onely to be set in his proper roume. &c. Then seeke further in your Table, what belongeth to.13. Inches: Lo. 10. ynches and.$\frac{1}{2}$. This muste be numbred in the lyne.c.a. from c which lyne betokeneth the thicknes of the Ruler. Make there a little stryke vpon that grosnes, euen or ryght agaynst the measure. 10.$\frac{1}{2}$. what nede many woordes. Thus do vntyll ye come to. 36. Inches, and and that is noted (as the Table of Tymber measure sheweth (right with.1.ynche, and .$\frac{1}{2}$. from c. No otherwyse is perfourmed of borde measure, as ye maye beholde set forthe by the helpe of his proper Table in the square roumes, beneath the line.e.f. and also in the other thicknes or lyne

The Carpenters Ruler.

The backside of the Ruler, with the Quadrant Geometricall.

THE XIII. CHAPTER.

The makinge of a geometricall quadrant

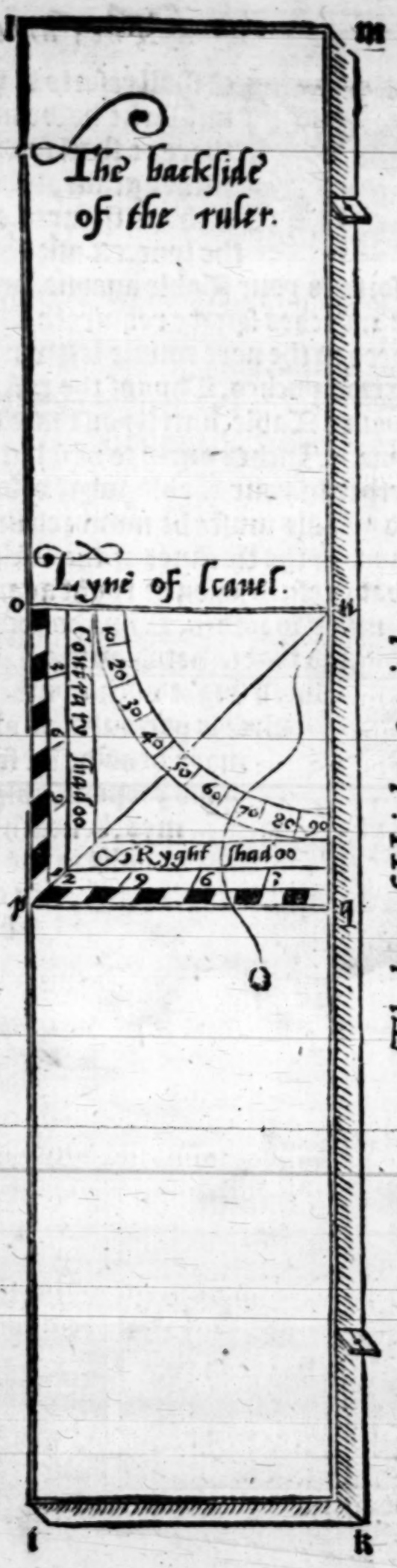
THis other fygure. i. k. l. m. is the backside of your Ruler, hauing in the middes a Geometrical quadrant. n. o. p. q. whose making in few woordes is thus expressed. The line or breadth of your ruler. n. o. ỹ lyne. o. p. p. q. q. n. ought to be of one equall iust lengthe, cutting eche other squirewyse. Also frō the centre. n. vnto. p. is drawen an other lyne, which is called the lyne of height. So is. o. n. the lyne of leuell q. n. the Lyne of Heightes vpright. This knowen, I open my compasse, one foote remayninge in the centre. n, the other extended in the lyne of leuell almoost to. o. makynge a Circumference vnto. q. n. whiche is a portion of a Circle named a Quadrant: and ought to be diuided into. 90. equall partes, as ye maye beholde euery of them called a degree. Ye may diuide the Lynes o. p. and. p. q. named the Scale, eche in. 12. as here, or in. 60. yea, in. 100. equall portions is more mete, for the vse of shadows, Heightes, Lengthes. &c.

Note these thre principall lynes.

Note that the syde or halfe Scale. o. p. is called the Contrary shadow: p. q. Right shadowe. Remēbre that vpon the thickneſſe m. k. ye ought tohaue two fine equal square sightes, wel bored, represented here by r. s., made of wode, or rather metall, to be fastened there when time requireth. Let this satisfye.

The diuided sydes. o. p. & p. q. are called the Scale.

The



The commune Vse of the Carpenters Ruler, touching the face afore put forthe.

THE XIIII. CHAPTER.

SVppose a pece of Tymber to be moaten, whose true square is.7.inches: this square appointeth you to the fygure of.7.in the lyne.g.h. vnder whom rightwarde in the place alligned to Tymber measure, is written 2.foote.11.ynches, and .3/7. As often as that measure ys founde in the length of youre Tymber, so many foote of Tymber is in that pece. *The .8. Chapter sheweth how the true square is foūd*

An other Ensample.

IMagyne your square to be.22.ynches: seeke in the lyne.a.c. Note then howe muche of your Ruler is left from that, to the ende of your Rule.c.and so much belongeth to a foote. Therefore laye out that measure vpon your Tymbre, and recken howe many tymes ye maye fynde it, from the one to the other of youre logge: for so many foote of Tymber is there. Euen thus of Borde. Seke the breadth vpon your Ruler, in the roume or place of borde measure, and immediatly before your eyes there remayneth what is to be layed out to make a iuste foote of borde.

The vse of the principall lynes in the Geometricall Quadrant on the backsyde of the Ruler, and fyrste of the Leuell lyne.

THE XV. CHAPTER.

IT behoueth you to loke thorow your sightes.q.r.placed in the thicknes or lyne.k.m. a fyne threde and plummet fallinge at libertie out of the centre.n. If this plummet and threde chaunce precisely on the lyne of Leauel (whiche is.n.o.) whatsoeuer ye se thorow the syghtes, is leauell with your eye: yf otherwyse, the thinge that ye looke vnto is not leuell, eyther more or lesse then the height or leuel of your eye: More yf the plummet fall to youwarde: Lesse, if contrary.

The vse of the Howe by the lyne of Leuell to forsee whether the water of any springe or head is possible to be brought to a place apointed, and also to iudge the holesomnes of it.

THE XVI. CHAPTER.

YE shall go to the head or spring, and set your Ruler to your eye (being in height equall with the water) so ỹ the syne corde and plummet fal precisely on the line of Leauell. Nowe yf thorow the syghtes, ye may se aboue the place, knowe and iudge the water possible to be brought, yf your syght fall vnder, impossible. It cometh communely to passe when the place to the whiche ye woulde haue water conueyed, is of any great distaunce from the heade, then hylles, valleyes, and suche lyke impedimentes lette the lyne vysuall to haue his free course: wherefore this remedy is prouided. At the heade of the springe, ye shall loke thorow the syghtes (as before) and note a marke in the next hyll towarde the place, then go to ỹ marke: in lyke maner obserue there an other in some hyll: so forthe vntyl by any of them ye may perceyue the place desyred. If then your syght running through the pinnes of your ruler, (the threde euer fallinge on the lyne. n. o.) excede that place, the cõueinge of your water is possible: otherwise not. Nowe by the waye briefly ye shall be enstructed howe ye maye knowe the holesomnes of water.

How good water is knowen.

TAke a cleane pot and put water in it: so set it on the fyre: after a little boiling, poure it owte: if thẽ no filthie remaine in the bottome of the potte, it maye be iudged the houlsomer. Or thus. Let fall droppes vpon metel, or rather on glasse (any of them beinge polished) and suffer that to drye by it selfe: if after there remayne no spot or sygne, it is a good token. Moreouer, if your water be swete, pure, clere, light, or of littel weight, it followeth ỹ water to be holesome for the vse of man.

Of

Of the line of Heigt.

When so euer the threde and plommet do chaũce iustly on the heigt which is n,p: the altitude or height that ye see is euen with the distãce from the Middle of your fote to ẏ nether parte directly vnder the toppe equal with your standinge, addinge the heigt of your eye downewarde, Know that ye must euer stande vpright with body and necke, your fete iuste to gether, the one eye closed. &c.

The line of vpright Altitudes.

IUdge also any thing plumbe vpright when the thickenes of your Ruler. i. l. is closely theron, the plummet then at libertie, fallynge on. q. n, named the line of Heightes vpright. Nowe foloweth the vse of the Scale.

To searche out heightes by the Scale, with the ayde of two places.

THE XVIII. CHAPTER.

LEt the threade and plummet fal in the one, on the. 12. poyntes: in thother stacion, on the. 6. of the right shadowe: double the distãce betwene the two places, the summitie appeareth from that part of ẏ thing measured, which is equall in hight with your eye. Or the one in the. 12, the other in. 8. of right shadow: then tryple the distãce. The one in the. 12. the other in. 6. of right, quaduplate the space. The one in the. 12. the other in. 6. of the contrary shadowe, then the space betwene bothe ẏ stacions is equall with that ye measure, euer vnderstandinge from your eye vpwarde. Euen that same cometh to passe, if in the one the threde be founde vpon the. 6. of the contrary, in the other one the. 4. of the same. or the. 4. and. 3. of the cõtrary: In all thes the Spaces are equall with the altitudes. So then in measurynge the distaunce betwene the two places, ye haue the heyght, from your eye vpwarde, puttyng to it the length from your syght downewarde, the whole Altitude appeareth: the base beynge equall wyth your standinge.

I Woulde not haue you ignorant here howe to knowe lengthes which be in height not easy to come vnto. Fyrste (as before) get the height of the toppe, the altitude of the base or longest parte of your lengthe. Subduct the lesse heigthe out of the more, of force your desyred lengthe remayneth. Or thus: Let the plummet and threde fall in the .12. marke your place: go in towarde the thinge (the threde as it was) vntyll ye see the base of that lengthe: the distaunce betwene the two standinges, is vndoubtedly the lengthe.

How lenghts in height are knowen.

Howe with the Scale, direct or vpright heightes, by theyr shadowes are declared.

THE XIX. CHAPTER.

TVrne your leftsyde vnto the Sunne, sufferinge his beames to pearce both your syghtes. q. r. placed as afore is sayed in the thycknes or lyne. k. l. The threde or plummet then hangynge at lybertye out of the Centre. n. sheweth aswel the degrees of height to be compted from. o. as the partes of the Scale cut. If your threde be founde in the .12. parte, or lyne of leauell, shadowes of all thinges being perpendiculer eleuated, are equall with theyr bodyes. If the plummet with the threde be perceyued cuttinge the partes nexte to the syghtes whiche I name pointes of the right shadowe, then euery thinge direct is more then his shadowe, by that proporcion which .12. exceadeth the parts, where the threde was founde. If yt fall in .1. that is the fyrste parte of the ryght shadowe, take the shadowe twelue tymes to make the height. In two: that is the seconde parte. Sixe tymes. In the thyrde, foure tymes. In the fourth, thre tymes. In the fyfte, twyse: and $\frac{1}{2}$. of the shadowe. In the syxte, twyse In the seuenth once, and $\frac{1}{2}$. In the eyght once: and $\frac{1}{2}$. In the nynthe once, and $\frac{1}{2}$. In the tenthe once, and $\frac{1}{2}$. In the eleuenth ye shal take the shadow once, and $\frac{1}{11}$. parte of it.

Right shadow

If the arte of numbring were had, I woulde will you to multiply the lengthe of the shadowe by .12. and the product diuide by the parts, in the whiche ye founde the threde.

But and yf yt be in the partes of the contrary shadowe, augment the

the lengthe of the shadowe wyth the partes declared by the plummet: and the encrease diuide by. 12. so commeth the altitude also. *Contrary shadowe.*

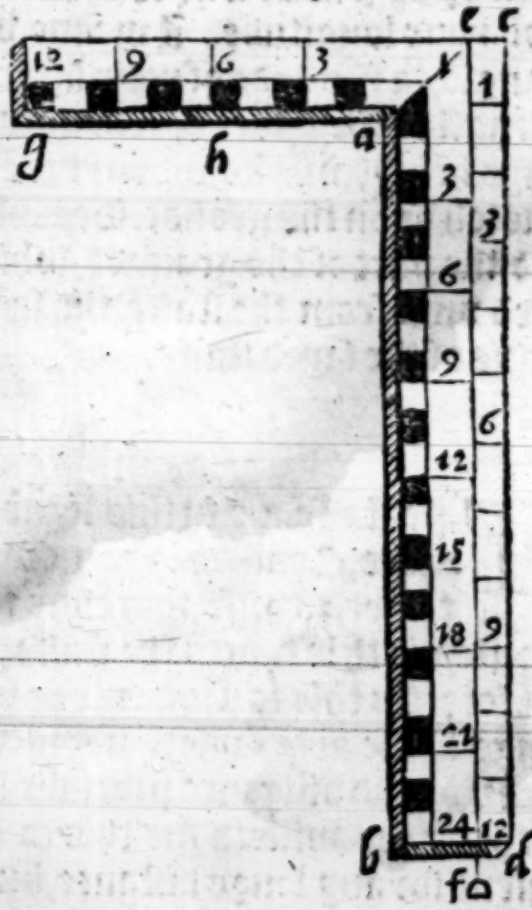
Thus the composition and whole appliance of the Carpenters ruler is shewed: therfore somewhat shal be now sayde of the squire.

I am not ignorant that the cõmune vse of him is better knowen than I can wyth many wordes expresse, wherfore I leaue to write in that behalfe. Notwithstandynge I wyll declare how Heightes, & Lenghtes are taken. &c. matters rare, and knowen of few Artificers. Also by tables to get a true knowledge of the daye houre, and that diuers wayes, wyth the helpe of the squyre: as is opened in my generall Prognostication augmented in the yere of our Lord. 1556.

Vvhat length the sides of thy Squyre ought to be, and the diuision of him.

THE XX. CHAPTER.

I Nede not to put forthe the cracte making of this Instrument so wel knowen. Loe therfore the fygure. One side supposed two fote from the inwarde angle: and the other a iuste fote from the same. The longer. a b. inwardly diuided from the angle. a. vnto. b. into. 24. equall principall partes, and euery of them into a lesse (if ye lyst) ech conteynyng. 10. minutes. Also the side. c. d. in the outward contrary plain from the toppe. c. vnto. d is diuided into. 12. euen portions: and again (if ye require cractnes) euery of thẽ into. 6. eche of value. 10. minutes. Behold a line & plũmet falling from e. to f. a parallel to c d, and a. b. Thus this squire is well framed for the vse of diuers tables put forthe in my general prognostication, & also for ỹ finding of Altitudes and Longitudes, which here I purpose now briefly to open.



The vse of the Howe by this Squire heightes are knowen.

Altitudes or heghtes are founde, the line or plūmet centred in the .6. poynte, cuttynge .h. the middle of .a.g. The moueable sightes placed in .a.g, or a parallel from that line, not vnelike as is opened of the line of heigte, in the backe of my ruler.

How Lengthes in pleine grounde are searched by the Carpenters or Masons Squire.

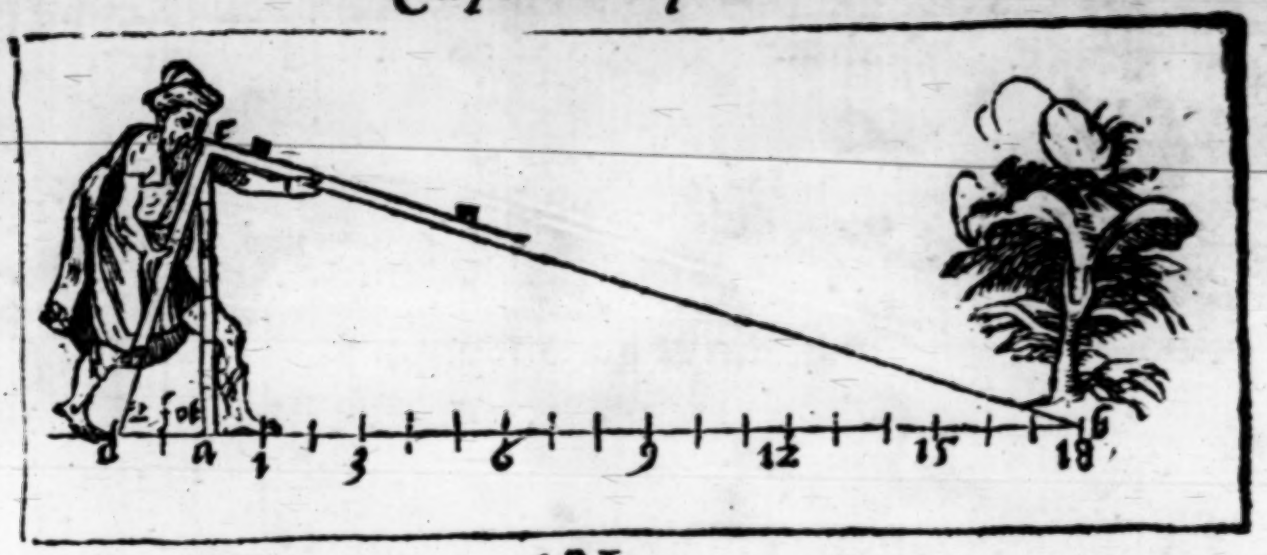
THE XXI. CHAPTER.

TAke a staffe deuided into certaine portions as ye list, in .100. or .1000. parts. At the beginning of your Length vpon the very toppe directlye standinge: set the inwarde angle of the squire: lift vp or put downe this instrument vntyle ye see the fardist parte of your longitude. I meane vntyll your sight runnynge from that angle, to the ende of your squire come vnto the fardest parte of that length. The squire so remaininge, and the staffe not remoued frome hys height, marke where the other ende of the squyre nert vnto you noteth vpon the grounde. See what proporcion the staffe then beareth to the part of the grounde, which the nerest ende of the squyre poynted vnto from the staffe, the same shal the Length haue to the quantitie of the sayed staffe.

Ensample.

The cause is taken oute of Euclide .32. pro. 1. boke: and the .4. pro. 6. boke.

THe staffe .a.c. in this figure is imagined .6. fote, & the space .a.d. 2. fote, Considerinye nowe that .6. the length of the staffe conteinet .2. thrise, therefore the lōgitude desired .a.b. of force muste conteyne thre tymes the staffe (whiche staffe is .6. fote,) that maketh 18. fote. As this is proued true by a small grounde in the figure folowinge: so the arte fayleth not in a greater space, whiche the good speculator and diligente practiser by anye waye canne not denye. Yet experience willeth me this to confesse, that the squire is not conuenient for any longe distance, but the Instrumēt Geometrical (whose makinge and vse ye may parceaue in the treatice folowinge) vnlesse ye attend some Tree or turret for your ayde, which length knowen, shall stande in the steade of youre staffe.



A Note.

IT behoueth you to haue a fyne coarde, made faſt in the vpper parte of your ſtaffe.c. whyche ſhall be tyed euen wyth the inwarde edge of the ſquire, and ſo drawen to the grounde, where the neare ende of the ſquare from the ſtaffe poynted, as ye ſee.d.c.the other ende then truelye directinge to the fardeſt diſtaunce.

Knowe that the grounde muſte be very playne and leauel, otherwyſe errour enſueth.

Thus the vſe of the Squyre is here ſomewhat declared, but more in my generall Prognoſtication, yea, mooſte plentifullye hereafter (God ſparinge lyfe) in a booke titled ẏ rare vſe of ẏ Squire in practiſes Mathematicall: in the which boke profitable pleſaunte experiences ſhall be playnelye opened (onelye of me practiſed) as well of Perſpectiue, as of the Mathematicals in generall.

I Had thought here folowinge to haue placed the ready handelynge of the compaſſe, yea and to haue ſhewed the fygurynge and true makynge of all maner letters, bothe Texte and Romayn, wyth the beſt proporcyon, the quantity as ye would demaũde, beſides that, ſo to place them in height and negrer to the ſight, that they beyng of diuers magnitudes myght appeare to the eye, of ons bygnes. This when I did attempt to brynge to their capacitie, ſemed ſomewhat dificulte wythout pennynge many wordes. Wherfore I omitted it, belongyng rather to the Paynter, then to the Carpenter for whoſe ſake onely the reſt alore ſemeth to be compiled. Here after (as I ſe men deſirefull) my endeuour may be to adde that, and other thinges neceſſarie.

Carpenters Square

¶ A lyttle treatise declaringe the makinge and vse of an Instrument Geometricall (so farre as it fardereth the Landemeter or Carpenter) named the profitable Staffe.

TO THE READER.

I Sayde in the begynninge that no lyttle boke woulde conteyne the makynge, and manyfolde fruites of this pryncely Instrument, if it were set forthe as it ought to be.

Certes the trueth euen here maketh mee confesse the same: yea, that there is no instrument so generall and profitably pleasaunt.

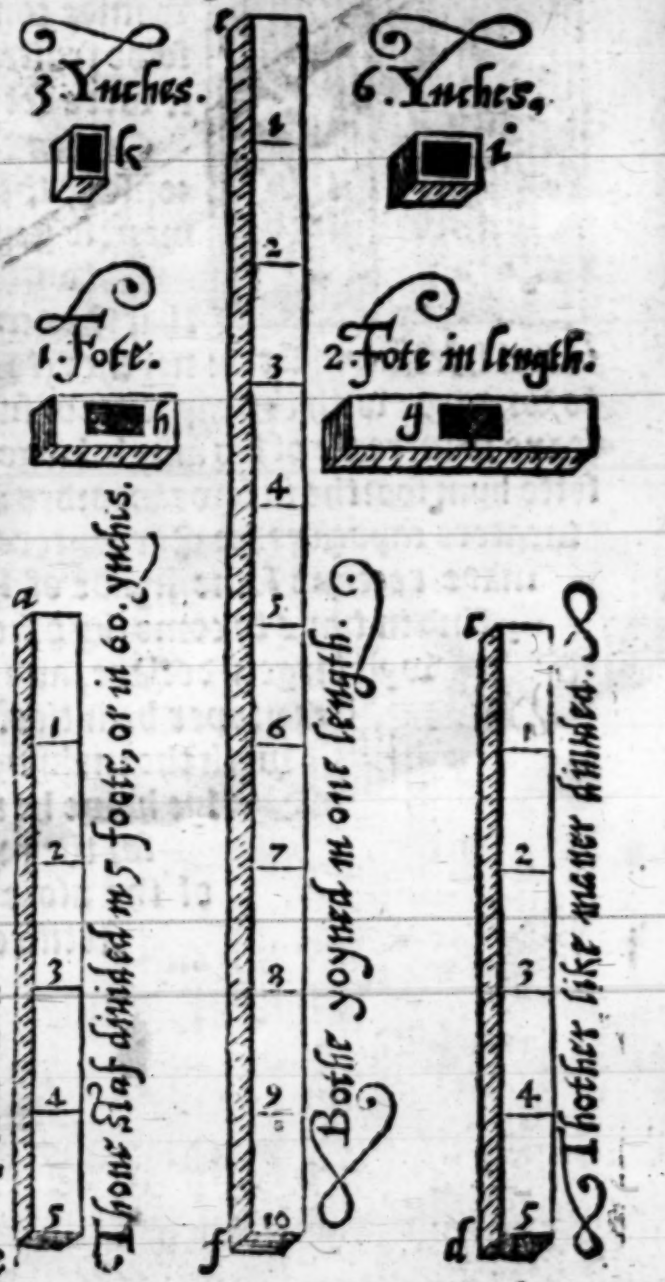
Notwithstandinge knowe (gentle reader) that the occasion of his chiefe vse and profite is not here mynystred: neyther (to say the trueth) doth it apperteine to, or agree with the capacitie of suche Artificers. Therfore I shall leaue to intreate of his ample large vse, and best makynge, and wyl sette hym forthe in fewe woordes: yea, sufficientlye for the Landemeaters capacitye, or Carpenters purpose, that at the leaste they maye receaue some kynde of fruite with the Geometrer. And in tyme to come (by other meanes) as I se cause I wyll largely declare, and there decke him wyth hys proper beauties. Here nowe foloweth the makyng, and so briefly howe he is applied for the profite of the afore named Artificers.

He that declareth manifold fruites of this instrumẽt, legat gẽme fricti de radio astronomico, & geometrico, libro.

The vse of the
The makinge of this profitable Rodde or Staffe.

THE FIRST CHAPTER.

YE shall prepare two small, streghte, stytte, rounde, or rather square Roddes, of mettall or of wodde well playned, of lyke bygnesse and lengthe. Although it make no matter of what lengthe, yet to auoyde the errours, whiche lyttle instrumentes and short staues bryngе, and also to beare wyth the rude vnwonte handelynge of suche Artificers: let your Roddes be eche fiue, or at the least thre fote, and euerye fote diuided in. 12. euen partes or inches, as ye se. a. b. c. d. These roddes muste be forged wyth a vize in the ende of them to ioyne readely. 10. or. 6. fote in lengthe, (when time requireth) as the Figure e. f. sheweth. Also ye muste get (bi the helpe of some Craftesman. 4. other like roddes, the longer g. 2 fote: the nert. h. 1. fote: the other. i. 6. inches: then k. 3. inches the last and shortest. l. 1. inche ½. Eche of these must haue in their myddes a hole, that the longe staffe of. 10. fote may be put thorow them, & they moued on him at pleasure vp & downe, alwaies cuttynge the longer staffe. e. f squyrewise, and made to tary on any diuision as occasion shall be geuen: whiche all are easye to be perceaued by the figures folowynge, although my rude declaracion hath not expressed my meanynge.



Here

	5	6	7	8	9	10	11	12	13	
1	108	123	143	165	190	213	59		79	
5	112	129	150		172	197	220	63	74	
10	118	136	153	18	216	227	68	78		Alramech.
15	123	214	156	192	214	233	71	81		
20	130	151	173	199	220	239	75	86		Oculus Tauri
25	237	158	183	207	228	244	79	90		
30	146	165	191	21[illegible]	23	249	82	93		

For the night. From euening to nudnight.

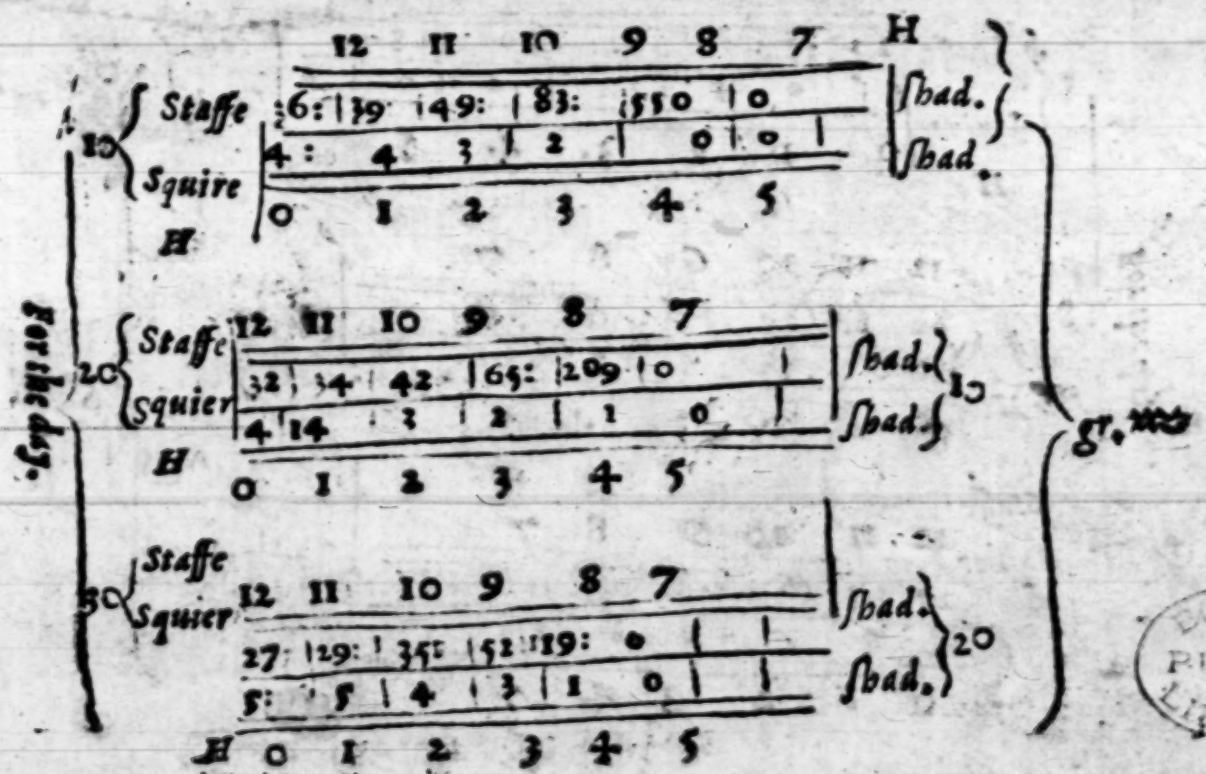
Ianuary hath xxxi. daies

81	93	105	121	143	168	196		
85	96	110	127	151	177	205		1
89	101	116	135	160	189	214		5
93	105	122	143	169	198	223		10
98	111	128	152	179	207	230		15
101	116	135	159	190	216	236		20
190	121	144	168	198	222	242		25
1	2	3	4	5	6	7		30

From midnight vnto day. Alramech.

For the day.

		12	11	10	9	8	7	H	
10	Staffe	36:	39	49:	83:	550	0		shad.
	Squire	4:	4	3	2	0	0		shad.
	H	0	1	2	3	4	5		
20	Staffe	12	11	10	9	8	7		
	Squier	32	34	42	65:	209	0		shad. 10
	H	4	14	3	2	1	0		shad.
		0	1	2	3	4	5		
30	Staffe	12	11	10	9	8	7		
	Squier	27	29:	35:	52	19:	0		shad. 20
		5:	5	4	3	1	0		shad.
	H	0	1	2	3	4	5		



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9	194	210	62	73	83	9:	
5	174	199	222	64	75	86	98
10	84	207	228	68	79	90	102
1	161	214	234	71	82	94	106
10	198	210	238	75	86	98	111
25	205	226	243	78	88	100	116
30							

Aldramech.

Oculus Tauri

Aldramech.

For the night. From midnight vnto day. From euening to midnight. For the night.

February hath xxviii. daies

1	108	124	164	172	201	225	
5	111	129	153	180	207	231	
10	117	136	162	190	216	237	
15	122	144	169	198	223	243	
20	128	152	178	206	230	248	
25	134	159	188	214	236	252	
30							

1 2 3 4 5 6

For the day.

8 Staffe / Squire — H

	12	11	10	9	8	7	H	
Staffe	2:	25	30:	42:	80	68	56	Shad.
Squire	6:	6	5	3	2	0		Shad.

0 1 2 3 4 5

18 Staffe / Squier — H

	12	11	10	6	8	7		
Staffe	20	21.	25.	34:	61	226		Shad.
Squier	7	7	6	4	2	1		Shad.

0 1 2 3 4 5

28 Staffe / Squier

	12	11	10	9	8	7		
	17	18:	22:	29:	45	152		Shad.
	8:	8	6:	5	3	2		Shad.

H 0 1 2 3 4 5

grad. 0 20

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5	59	70	81	93	105	120		
10	62	74	84	95	108	125		
15	65	76	87	99	113	131		
20	69	80	91	103	118	138		
25	72	83	94	107	123	146		
30	75	86	98	112	129	153		
	80	90	102	117	135	161		

From midnight vnto day

For the nyght.

Marche hath.xxxi.dayes.

	142	168	196	222	241			
1	147	173	201	227	245			
5	157	183	210	232	250			
10	163	192	218	238	255			
15	171	200	225	243	259			
20	180	208	232	249	262			
25	191	216	237	254	267			
30								
	1	2	3	4	5	6		

From Euening to midnigt.

Alramech.

For the day.

		12	11	10	9	8	7		H	
11	Staffe	5	16.	19.	24	37:	74:		ſhad.	0
	Squire	9	9:	8.	6.	4.	2		ſhad.	
	H	0	1	2	3	4	5			

		12	11	10	9	8	7	6	H	
21	Staffe	13	14	16.	21:	30.	54	22:		
	Squire	1	10	9	7	5	2	1.	ſhad.	10
	H	0	1	2	3	4	5	6	ſhad.	

		12	11	10	9	8	7	6	H	
31	Staffe	11:	12:	14.	18.	25:	43	112	ſhad.	20
	Squire	12	12	10	8:	5:	3	1	ſhad.	
	H	0	1	2	3	4	5	6		

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Alramech.

Alramech.

For the nyght.

From midnight vnto day.

From euen ing to midnight.

8	9	10	11	12				
92	104	118	138	164				
94	107	123	145	171				
98	111	129	153	180				
101	117	135	160	189				
105	122	144	168	198				
111	128	152	178	207				
117	135	159	189	215				

Aprill hath. xxx. dayes.

103	218	229	255				
99	225	244	258				
207	231	248	262				
215	236	253	266				
223	243	257	270				
230	248	262	274				
236	252	266	278				
1	2	3	4	5			

1 5 10 15 20 25 30

For the day.

10 Staffe / Squire

12	11	10	9	8	7	6	H
10	11	13	16	23	36	76	shad.
14	13	11	9	6	4	2	shad.
H	0	1	2	3	4	5	6

21 Staffe / Squire

12	11	10	9	8	7	6	H
9	9	11	15	21	31	58	207 shad.
16	15	12	9	7	4	2	1 shad.
H	1	2	3	4	5	6	

31 Staffe / Squire

12	11	10	9	8	7	6	5	H
8	28	10	14	19	28	49	139	shad.
18	17	14	10	7	5	3	1	shad.
0	1	2	3	4	5	6	7	

gr. 8

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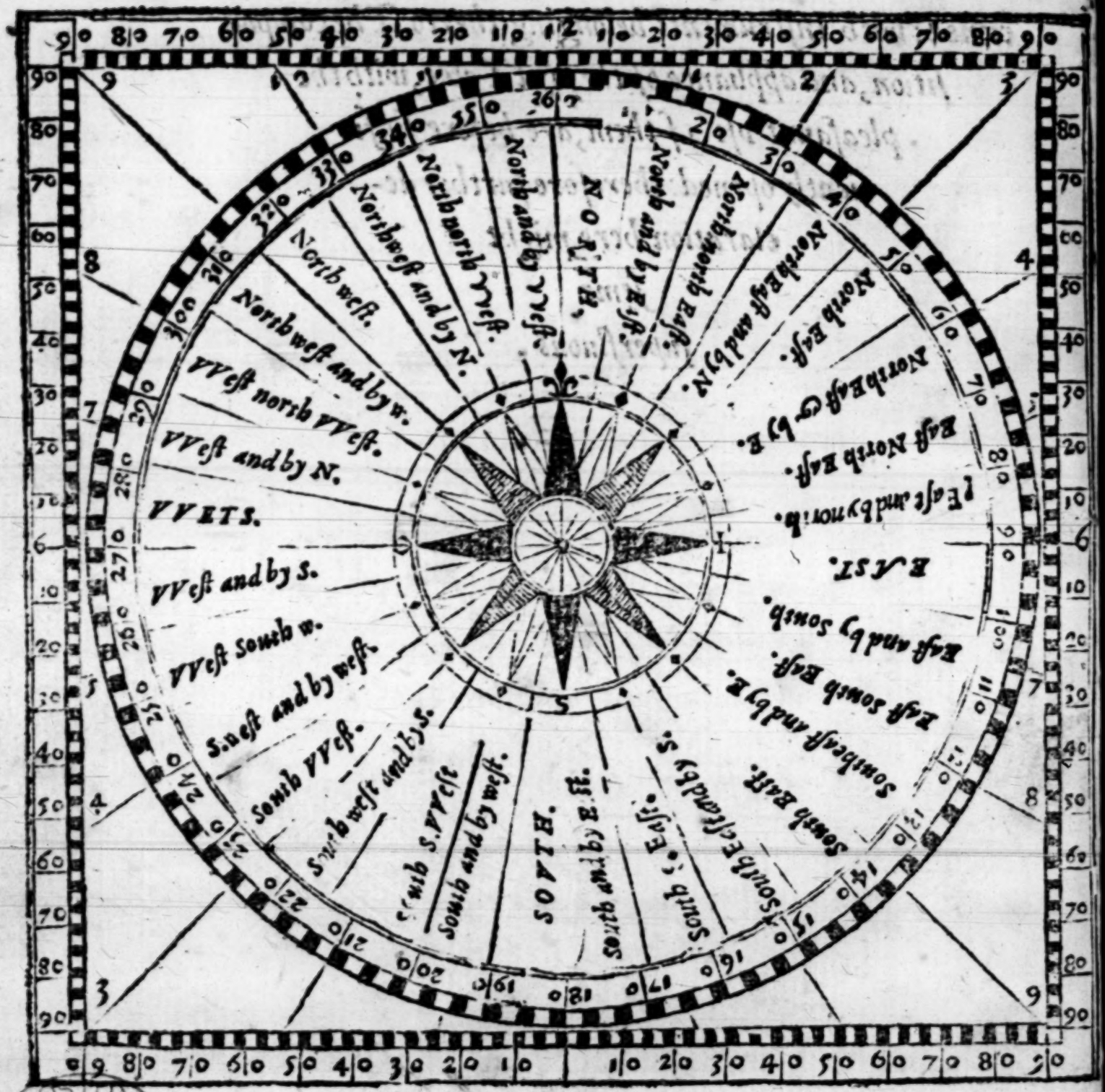
NOVVE ENSVETHE THE
nedeful neceſſary, peculiar Kalender tofore men-
cioned: with Inſtruments belonging therto. The compo-
ſition, and appliance of the ſayd Table, with the
pleaſaunt vſe of them, are before ſuffi-
ciently opened: therefore further de-
claration here, might
ſeme
ſuperfluous:

A neceſſary Inſtrument, to finde exactly, the houre of the day, and night diuers wayes, VVith helpe of this Peculiar Kalendare.



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	8	9	10	11	12			
1								
5	117	13	160	190	216			
10	12[illegible]	142	168	196	222			
15	128	152	178	206	230			
20	134	159	188	214	235			
25	143	168	196	222	241			
30	151	177	206	230	248			
	160	189	215	236	231			

For the nyght. From midnight vnto day

May hath.xxxi.dayes.

	237	253	167	278				
	241	256	269	280				
	247	261	273	285				
	252	266	278	288				
	257	270	281	296				
	262	274	285	296				
	256	278	288	300				
	1	2	3	4	5			

From Euening to midnigt.

5 10 15 20 25 30 Alramech.

For the day.

		12	11	10	9	8	7	6	5	H	
2	Staffe	7	8.	10:	13	17:	26:	43	100	shad.	0
	Squire	20	18:	15.	11.	8.	5	3	1	shad.	
	H	0	1	2	3	4	5	6	7		

		12	11	10	9	8	7	6	5	4	H	
2[illegible]	Staffe	7	7	9.	12:	17	24	39	82	2580		
	Squire	21	19	15	12	8	4	2.			shad.	10
	H	0	1	2	3	4	5	6	7	8	shad.	

		12	11	10	9	8	7	6	5	H	
32	Staffe	6:	7:	9.	12	16.	23	7	74	56:	shad.	20
	Squire	22	19	16	12	9	6	4	2		shad.	
	H	0	1	2	3	4	5	6	7			

gra. II

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Alramech.

	8	9	10	11	12				
1	161	191	216	237	254				
5	169	197	223	242	257				
10	180	207	231	249	262				
15	191	216	237	254	267				
20	199	224	243	258	271				
25	207	231	249	262	275				
30	216	237	254	297	379				

For the nyght. — *From euening to midnight.*

Iune hath. xxx. dayes.

1	267	279	290	301					
5	270	282	292	303					
10	274	285	297	308					
15	279	290	301						
20	283	293	394						
25	286	297	308						
30	290	301	82						
	1	2	3	4	5				

From midnight vnto day.

For the day.

		12	11	10	9	8	7	6	5	4	H	
1	Staffe	6	7:	9:	12	16.	23:	37:	74	56 5:	shad.	20 gr. II
	Squire	22	20	16:	12:	9:	6:	4:	2:		shad.	
	H	0	1	2	3	4	5	6	7	8		

		12	11	10	9	8	7	6	5	4	H	
12	Staffe	6	7	9.	12.	16	23	37	72	565	shad.	0
	Squire	22	20:	16.	12.	9	6	4	2	0	shad.	
	H	0	1	2	3	4	5	6	7	8		

		12	11	10	9	8	7	6	5	4	H	
23	Staffe	6:	7	9:	12:	16:	23:	37:	74	565	shad.	10
	Squire	22	20	16	12.	9:	6:	4:	2		shad.	
		0	1	2	3	4	5	6	7	8		

gr. 95

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	8	9	10	11	12				
1	219	239	255	268	280				
5	225	244	259	272	283				
10	233	250	264	275	286				
15	238	254	297	279	290				Alramech.
20	243	258	271	283	293				
25	249	262	275	286	297				
30	254	267	279	290	300				

From euening to midnight.

Iuly hath. xxxi. dayes.

1	290	302	83						
5	293	304	86						
10	297	79	90						Alramech.
15	301	82	93						
20	304	86	98						Oculus Tauri
25	308	89	101						
30	82	93	106						
	1	2	3	4	5				

From midnight vnto day.

For the nyght.

For the day.

		12	11	10	9	8	7	6	5	4	H	
3	Staffe	7	7:	12:	16	24.	39:	82:	258:		shad.	20 gr. ♋
	Squire	21	19	15:	12:	8:	6:	4:	2:		shad.	
	H	0	1	2	3	4	5	6	7	8		

		12	11	10	9	8	7	6	5	H		
14	Staffe	7	8	10.	13.	17	26	43	100		shad.	0
	Squire	20	18:	15.	11.	8	5	3	1		shad.	
	H	0	1	2	3	4	5	6	7			

		12	11	10	9	8	7	6	5	H		
24	Staffe	8:	8	10:	14:	19:	28:	46:	139		shad.	10
	Squire	18	17	14	10.	7:	5:	3:	1		shad.	
		0	1	2	3	4	5	6	7			

gr. ♌

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		8	9	10	11	12				
	1	255	257	279	291	302				
Alramech.	5	259	272	284	294	304				
	10	263	275	286	297	79				
Oculus Tauri	15	267	279	290	300	81				
	20	270	282	292	303	86				
	25	274	285	296	308	88				
	30	278	288	299	81	92				

From euening to midnight.

For the nyght.

August hath. xxxi. dayes.

	82	94	107	122	141				1
	86	98	111	126	146				5
	89	102	116	132	154				10
	93	105	119	138	160				15
	96	110	125	144	167				20
Oculus Tauri	100	114	130	152	174				25
	104	118	136	158	183				30
	1	2	3	4	5				

From midnight vnto day.

For the day.

		12	11	10	9	8	7	6	5	H	
3	Staffe	9	9:	11:	15	21.	31:	58:	207:	shad.	20gr. ♌
	Squire	16	15	12:	9:	7:	4:	2:	0:	shad.	
	H	0	1	2	3	4	5	6	7		

		12	11	10	9	8	7	6	H		
14	Staffe	10	11	13.	15.	23	36	76	shad.	0	gr. ♍
	Squire	14	13:	11.	9.	6	4	2	shad.		
	H		1	2	3	4	5	6			

		12	11	10	9	8	7	6	H		
24	Staffe	11:	12	14:	18:	26:	43:	11:	shad.	10	
	Squire	22	12	10	8.	5:	3:	1:	shad.		
		0	1	2	3	4	5	6			

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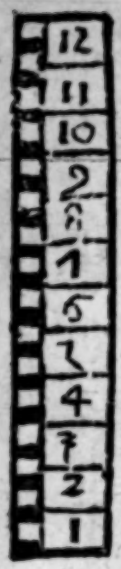
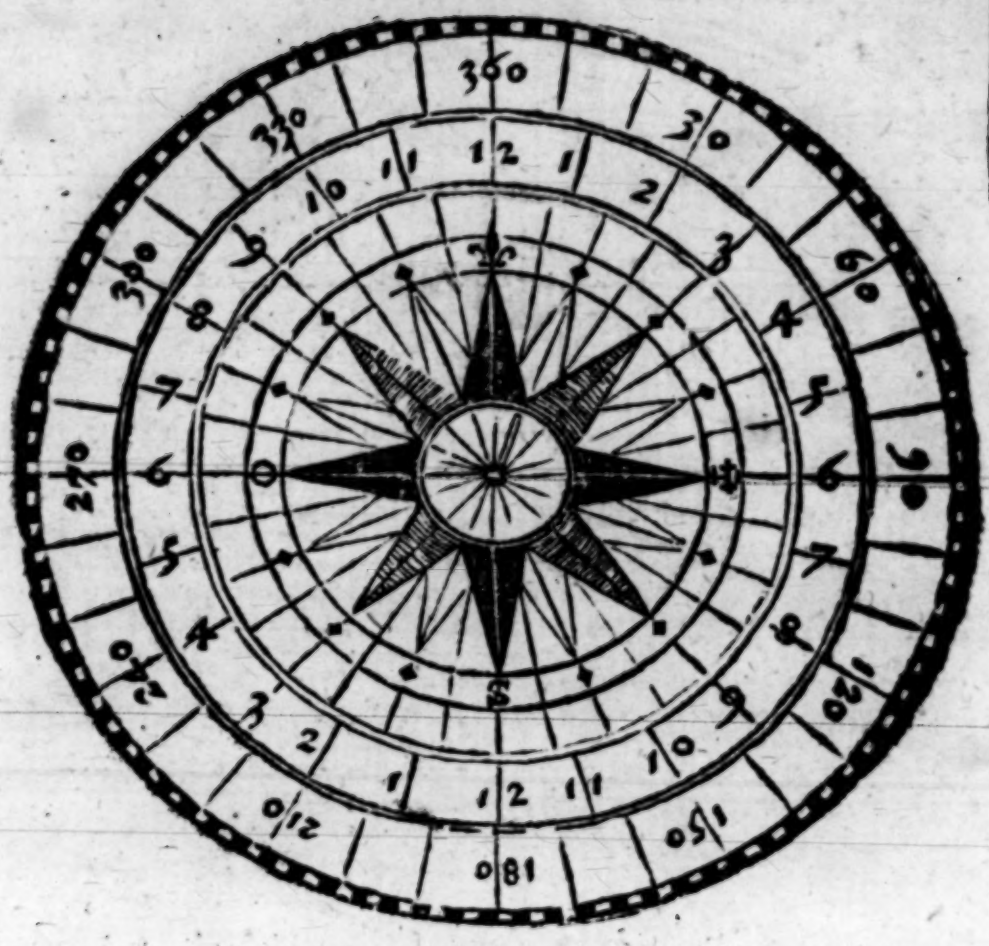


North.



VVest. East.

South.

Thus is ended the Peculiar Kalender, very cõmodious for the day and night houre. I haue here adioyned the Instrument vvithout the Square, vvhiche maye sufficie for the whole vse of the forsayde Kalendar, with the helpe of the Squire and Staffe.

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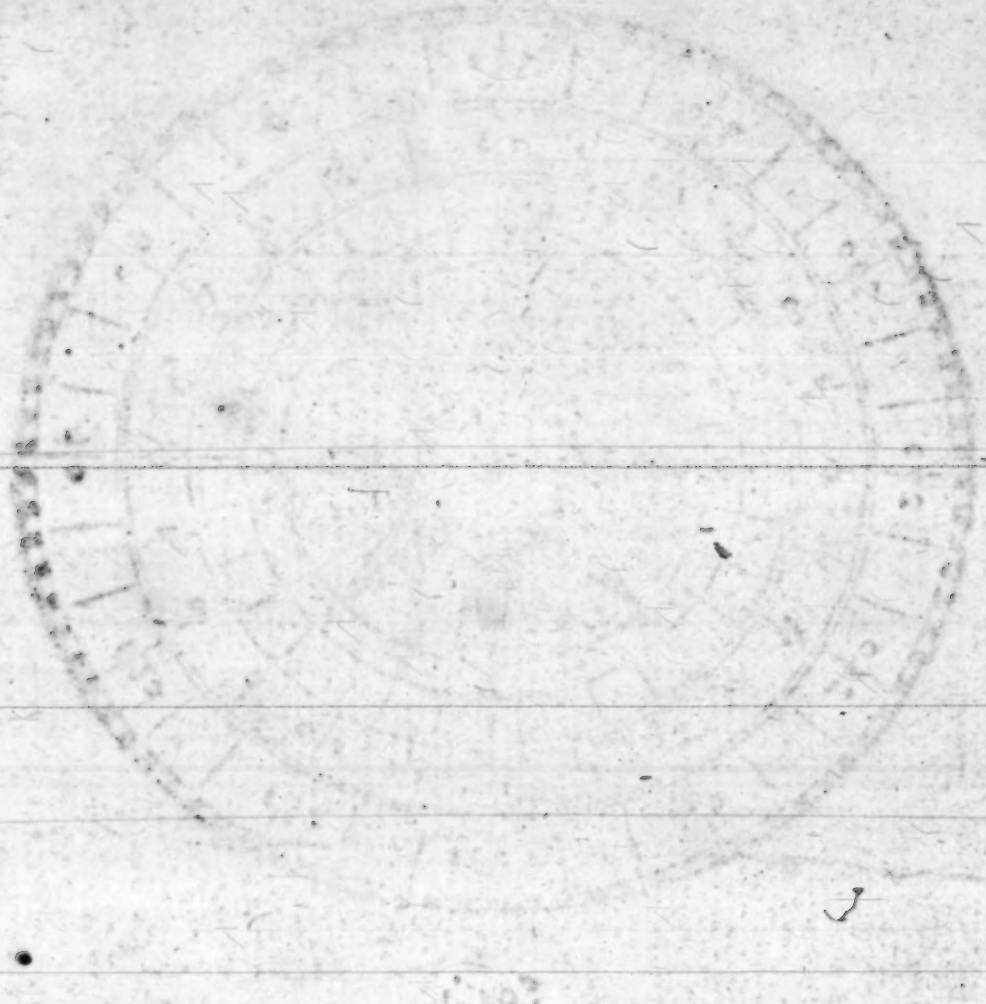

I May not here omitte a *Kalender generall* deuided in two partes, wherof the firſt containeth ſix Monethes, from *Ianuary* to *Iune*: The ſecond other ſix monethes from *Iuly* to *December*. In thys *Kalendar* are ſetforth the Feſtiuall dayes, the entring of the *Sunne* in the Signes *celeſtiall*, the euill dayes noted with one *Prick*. For a further declaration of thoſe euill dayes, read this folowing.

The yeare hath .xxxiii. euil daies general for euer.

IANVARY hath eyght ſuch daies, the.i. the.ii. the iiii. the.v. the.x. the. xv. the. xvii. the.xix. Drinke white wine this Moneth.

February hath thre dayes, the.viii. the.x. the.xvii. theſe not ſo euil, the xxvi. the.xxvii. the.xxviii. Eate no potage of okes or malowes: They are venemous.

Marche three dayes. the.xv. the.xvi. the.xix. this not ſo euill, the xxviii. day. This moneth, all ſwete meates are good.

April. two dais the.xvi. the.xxi. theſe not ſo euil, the vii. the. viii the x. the.xx. Vſe hote meates, of light digeſtion.

May three dayes, the.vii. the.xv. the.xx. theſe not ſo euill, the iii. the.vi. Riſe early, and vſe breakfaſt.

Iune two, the.iiii. the.vii: theſe not ſo euill, the.x. the.xi the.xxii. Sage & lettuſe are good to eat. Cold water faſting hurteth not.

Iuly two dayes, the.xv. the.xx, abſtain from carnality.

Auguſt two dayes, the.xix. the.xx. theſe not ſo euill, the firſt, the xxix, the.xxx. It hurteth not to abſtaine from potage, and all hotte meates and drinkes of ſpicery.

September two daies, the.vi. the.vii. theſe not ſo euil, the.iii. the iiii. the.xxi. the.xxii. Eate good fruit.

October one day, the vi: theſe not ſo euil, the iiii. the xvi. the.xxiiii God wyne is olſome this Moneth.

Nouember two dayes, the.xv. the.xix: theſe not ſo euil. the. v. the .t he.x x v iii, the.xxix. Blede not.

December thre daies, the .vi. the.v ii. the.ix, theſe dais not ſo euil, the.xv the.xvii. the.x xii. Blede not ouer muche. Warme not thy legges at the fyre.

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The generall Kalender.

The first part of the generall Kalendar: from Ianuarie to Iune.

Ianuarie.	Februarie.	March.	Daies	April.	May.	Iune.
:A Circũci.	d	d	1	g	b Phi. Iac.	e
:b	e Purifi.	e	2	A	c	f
c	f	f	3	b	.d	g
:d	g	g	4	c	e	:A
:e	A	A	5	d	f	b
f Epiph.	b	b	6	e	.g	c
g	c	c	7	.f	:A	:d
A	:d	d	8	.g	b	e
b	e ☉ in ♓	e	9	A	c	f
:c	:f	f	10	.b	d	.g
d ☉ in ♒	g	g ☉ in ♈	11	c ☉ in ♉	e	A Barna.
e	A	A Spring.	12	d	f ☉ in ♊	b ☉ in ♋
f Hilar.	b	b	13	e	g	c Sũmer.
g	c Valen.	c	14	f	:A	d
:A	d	:d	15	g	:b	.e
b	e	:e	16	:A	c	f
:c	:f	f	17	b	d	g
d	g	g	18	c	e	A
e	A	:A	19	d	f	b
f	b	b	20	.e	:g	c
g	c	c	21	:f	A	d
A	d	d	22	g	b	.e
b	e	e	23	A Georg.	c	f
c	f Ma.	f	24	b	d	g Ioã bap.
d Cõ. Pau.	g	g Arun.	25	c Marc.	e	A
e	A	A	26	d	f	b
f	.b	b	27	e	g	c
g	.c	.c	28	f	A	d
:A		d	29	g	b	e Pe. Pa.
b		e	30	A	c	f
c		f	31		d	

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The seconde part of the generall Kalendar: from Iulie to December.

Iuly.	August.	Septemb.	Dayes	October.	Nouem.	Decem.
g	.c Pet. Vin.	f	1	A	d Om. sa.	f
A	d	g	2	b	e Om. an.	g
b	e	.A	3	.c	f	A
c	f	.b	4	d	g	b
d	g	c	5	e	.A	c
e Dog beg.	A	:d	6	:f	.b	:d Nicol.
f	b	:e	7	g	c	:e
g	c	f Na. Ma.	8	A	d	f Cō. ma.
A	d	g	9	b	e	:g
b	e	A	10	c	f	A
c	f	b	11	d	g	b
d	g	c	12	e	A	c ☉ in ♑
e	A	d	13	f	b ☉ in ♐	d wynter.
f ☉ in ♌	b ☉ in ♍	e ☉ in ♎	14	g ☉ in ♏	c	e
:g	c	f Herueſt.	15	A	:d	.f
A	d	g	16	.b	e	g
b	e Dog end	A	17	:c	f	.A
c	f	b	18	d Luc.	g	b
d	:g	c	19	e	:A	c
:e	:A	d	20	f	b	d
f	b	.e Mathe.	21	g	c	e Tho. ap.
g Ma. mag.	c		22	A	d	f
A	d	g	23	b	e	g
b	e Barbo.	A	24	.c	f	A
c Luc. Apo.	f	b	25	d	g	b Na. do.
d	g	c	26	e	A	c Steph.
e	A	d	27	f	b	d Io. cud.
f	b	e	28	g Sy. Iud.	.c	e Innocē.
g	.c decol. Io.	f Micha.	29	A	.d	f Tho.
A	.d	g	30	b	e Andre.	g
b	e		31	c		A

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The generall Kalender.

Lo the briefe vſe of this generall Kalendar.

ENtre the Columpne where youre *Moneth* is noted in the hedde, ye ſhall there fynde running downe the Columpne the *Feſtiuall* dayes of that Moneth, the entrie of the *Sunne* in the *Coeleſtiall Signes*, the *Euill* dayes pricked &c.

I woulde haue placed in this *Kalendare* the *Fayres*, *Termes* alſo, but that canne not remaine continuall true: For thoſe that enſue mouable Feaſtes are moueable, and therfore may haue no certayne place, For the *Termes*, note theſe preceptes folowing The *Fayres*, ſhalbe declared by two *Table* immediatly enſuyng this *Kalendar generall*.

How to know the Termes.

KNow therfore, that *Eaſter Terme* alwayes begynneth the 18. daye after *Eaſter*, rekening *Eaſter daye for one*: and endeth the *Monday* next after the *Aſcention day*.

Trinitie Terme beginneth the *Friday* next after *Corpus Chriſti* day: and endeth the *Wedneſday* fortnight after.

Michaelmaſſe Terme beginneth the 9 or 10 day of *October*: and endeth the 28 or 29 of *Nouember*.

Hilary Terme beginneth the 23 or 24 day of *Ianuary*: and endeth the 12 or 13 day of *Februarye*,

FINIS.

A Table containing the Moneth, Daye, and Place of the principal Fayres of Englande: to be augmented at pleasure in order folovvyng

Iamuary. February. Marche.

The 6. day at Bzistow, at Salisbery. The first of *Lent* at Exeter.

The 2. day at Bathe, at Maydstone. The 14. at Feuersame. *Ashwednesday*, at Lychfelde, at Royston, at Tamworthe. The firste monday in *Lent*, at Cisiter, at Abington. The 24. at Henlye vpō. Temmes, at Teukesbury.

The 4. *Sonday in Lent*, at Stanforde, at Sudbery. The 5. Sonday at Grantam, at Salibury, the Monday before our Lady daye at Wisbich Palme euen The 13. at Wye. The 25. at Northampton, at Great Chart at Waulden.

April.

The 5. day at Walyngford. The 7. at Darby. The 9. at Byckelworth, at Byllingworth, at Ealam the *Mundy* after. The 3. *Sonday* after *Easter* at Louth. The 23. at Charing, at Ipswiche, at Amtill, at Hinigam, at Gilforde The 25. at Darby. The 26. at Tenterdē.

May.

The 1. day at Stow the old, at Readynge, at Maydstone, at Leiceter, at Chensford The 8. day at Beuerly, Ascention day, at Birmingcham, at S. Edes, at Bishoppes Statford. *Withsondaye*, at Kingstone vpon Temmes. Trinity Sondaye, at Rouel, at Cranbroke. The 19. day, the 27. day at Lenham.

June.

Corpus Christi. at Couentry, S. Edes, at Bishop Stanforth, at Rosse. The 9. at Maldstone. The 11. at Okingā. The 23. Shrowsbury, at S. Albons. The 24. at Cambridge, at Glocestre, at Lincoln, at Winsor Colchester. The 29. at Woller, at Hāpton, at Peterborow. The 17 at Folkston. The 24 at Harisā. The 2[illegible]. at Yetcorn.

A Table

General Faires.

A Table containing the Moneth, Day, and Place of the principal Fayres of England: to be augmented at *pleasure in order folowyng.*

July.

The 11. daye Horse fayre at Partney at Nabor, at Felix. The 12. day at Lyd. The 15. at Pinchbacke. The 17. at Wynchecome. The 20. at Urbridge, at Cattesby. The 22. at Harborow, at Winchester, at Colchester, at Tetbery The 25. at Brissow, at Dover at Chilham, at Ipswitch, at Northhamptō, at Darby, at S. James by London, at Reading, at Lowth, at Maelsbery.

August.

The 1. day at Feuersame, at Dōstable, at S. Edes, at Budforth at Harram Churche, at Wysbyche. The 9. at Rumney. The 10. at Bedford, at Fernam, at Strodes, at Blakamore S. Lau. at Walton. The 24. at London, at Tewrsbery, at Sudberry, at Norwich, at Northalerton, at Dover, at Rie. The 28. at Alhforde.

September.

The 8. day at Cambridge, at Sturbridge, at London in Southwork, at Smide, at Recolver, at Partney thre Lady daies. The 14. at Waltam Abbie, at Wotton vnder Hedge, at Smaldinge. The 21 at Croydon, at Hulden in Holdernelle, at S. Edmonds bery, at Haulton, at S. Jues, at Haldy Lanam, at Wyltemal, at Sittingborowe, at Dover, at Estrie. The 29 day at Canterbury.

October.

The 6 daye at S. Sithes beside Norwitche. The 13 at Graues ende, at Winsor, at Marchefelde. The 18 at Elye, at Staneton, at Charing. The 28 at Harford, at Ciciter, at Newmarket.

November.

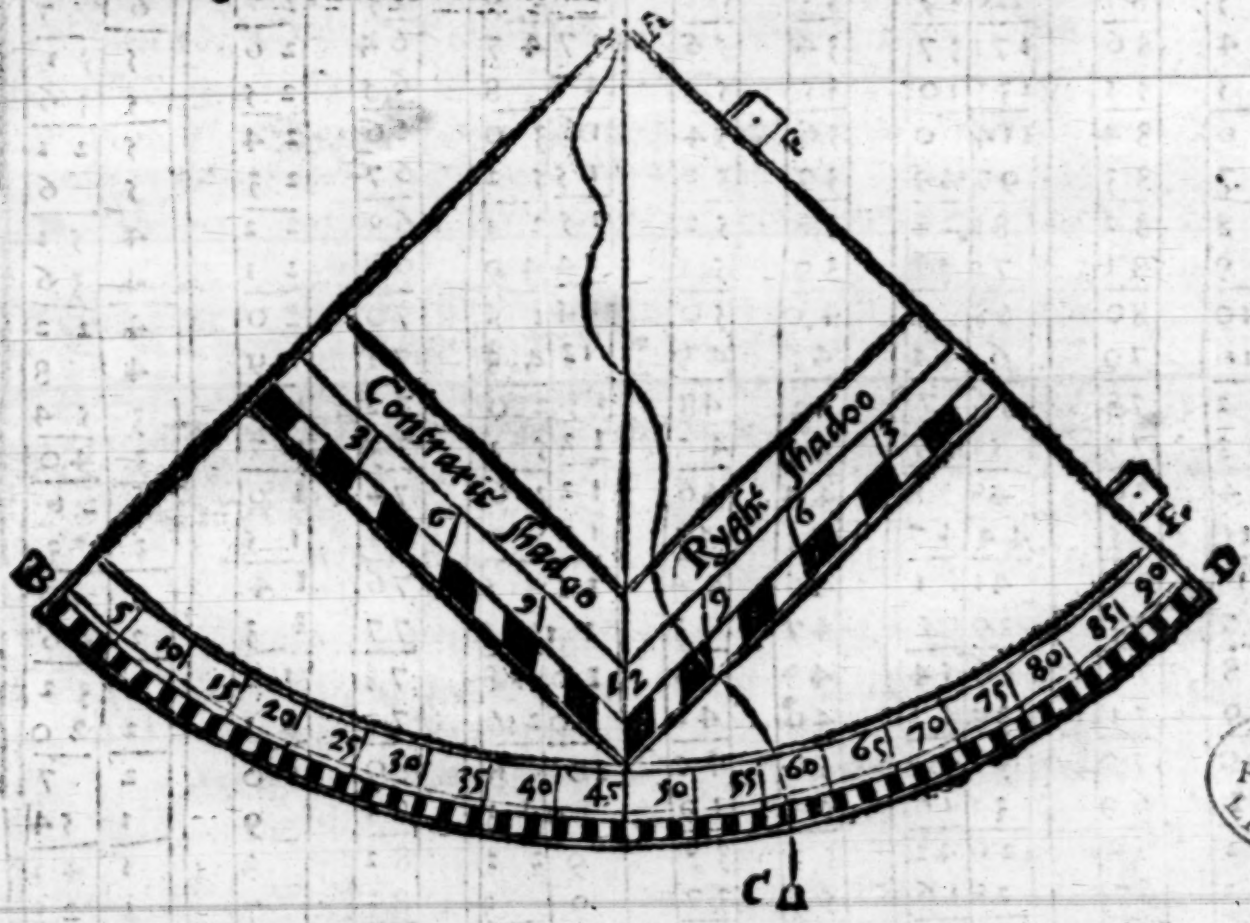
The 2 daye at Kingston, at Blechinglye. The 6 at Newporte ponde, at Standly. The 11 at Dover. The 13 at S. Edmonds bery The 20 at Hyth. The 23 at Sandwyche. The 30 at Rochester, at Haydenhead.

Decē.

The 29 at Canterbury. The 5 at Pluckley. The 6 at Spalding. The 7 at Sanderst.

BEcause I vnderstand many are desirous how to get exactly the iust length of *Staffe* and *Squier* shadow before treted of, vpon vnleauell grounds, or other wayes where so euer it be, yea without ather *Squier* or *Staffe*. I haue calculated a *Table* folowing, thorowly satisfying thē, so ỳ they get ỳ height of the *Sunne* any way, or as I shal now enstruct.

Behold this *Instrument* called a *Quadrant* the iust fourth part of a *Circle*, euen suche a *Circle* as I taughte you before to make for the nyght *Dyall*: containing the fourth part of his diuisions, that is 90 degrees, only two syghts and a plume lyne added, to be placed at the beginning of this booke as ye may there: and here see. I haue here also put the *Scale* to the *Quadrant*, whiche serueth well for shadowes, and as well for heyghtes. The vse of this *Scale* is declared in my boke called *Tectonicon*.



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How by this Instrument to get the height of the Sunne at all tymes.

LAte vp hansomly your *Quadrant* the *Sunne beames* persyng ỳ syghtes. The *Plomet* and *Lyne* then at liberty falling, noteth there the degrees of height at that present, with the whyche shal entre this *Table* immediatle folowing, to get them, and in like maner at all other times the iust shadow of the *Staffe* or *Squyer*.

A Table

A Table of Shadowes.

A Table generall of Shadowes, right and contrary for euery grade of the Sunnes heyght: The thinge causing Shadowe, supposed 12 partes.

Heyght of the Sunne.		Staffe. Shadow.		Heyght of the Sunne.		Staffe. Shadow.		Heyght of the Sunne.		Staffe. Shadowe.	
G	g	P	M	G	G	P	M	G	g	P	M
0	90	Sbc	m.	30	60	20	47	60	30	6	56
1	89	68	34	31	59	19	58	61	29	6	39
2	88	343	43	32	58	19	12	62	28	6	23
3	87	229	59	33	57	18	29	63	27	6	7
4	86	171	37	34	56	17	47	64	26	5	51
5	85	137	10	35	55	17	8	65	25	5	36
6	84	114	0	36	54	16	30	66	24	5	21
7	83	97	49	37	53	15	52	67	23	5	6
8	82	85	28	38	52	15	21	68	22	4	51
9	81	75	46	39	51	14	49	69	21	4	36
10	80	68	3	40	50	14	18	70	20	4	22
11	79	61	44	41	49	13	48	71	19	4	8
12	78	56	27	42	48	13	20	72	18	3	54
13	77	51	59	43	47	12	52	73	17	3	40
14	76	48	8	44	46	12	26	74	16	3	26
15	75	44	47	45	45	12	0	75	15	3	13
16	74	41	51	46	44	11	35	76	14	3	0
17	73	39	15	47	43	11	11	77	13	2	46
18	72	36	54	48	42	10	48	78	12	2	32
19	71	34	51	49	41	10	26	79	11	2	20
20	70	32	58	50	40	10	4	80	10	2	7
21	69	31	16	51	39	9	43	81	9	1	54
22	68	29	42	52	38	9	22	82	8	1	41
23	67	28	16	53	37	9	3	83	7	1	29
24	66	26	57	54	36	8	43	84	6	1	16
25	65	25	44	55	35	8	24	85	5	1	4
26	64	24	37	56	34	8	6	86	4	0	50
27	63	23	33	57	33	7	48	87	3	0	38
28	62	22	34	58	32	7	30	88	2	0	25
29	61	21	40	59	31	7	13	89	1	0	12
30	60	20	47	60	30	6	56	90	0	0	0
Heyght of the Sunne.		Squier. Shadow		Heyght of the Sunne		Squier. Shadow.		Heyght of the Sunne.		Squyer. Shadow.	

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The vse of thys Table, and fyrst for Staffe Shadow

Ensample:

Suppose the height of the Sūne taken by the Quadrant 34 degrees, nowe I require the eracte length of Staffe and Squier Shadowe. For ryght shadowe, first seke out the degrees in the left part of ỹ Table and vnder this title the heighte of the Sun: if they be not in that lefte rowe downewardes, resorte to the nert rowe and lyke tytle, vntyll ye fynde the degrees, then in ryght order toward the right hand, in the nert Columpne vnder the title of Staffe Shadow, are 17 partes and 47 minuts, your desyre.

For Squyer Shadowe, titled contrary Shadow.

Seke your degrees in the ryghte parte vpwarde at thys title *Heyght of the sunne*, in the botome of this *Table*: then shal ye find on the right hand of 34 degrees, in the nert Columpn 8 *partes* and 6 *Minutes*: that is the very lengthe of *Squier shadowe*, when the Sunne is 34 degrees in height.

Occasioned I cannot here omitte an other *Table* faythfullye supputated for the *Sunnes altitude*, by the which with quicke speade the houre is knowen. This *Table* conducteth manyfolde wayes, yea to the Composition of diuers and many Instrumentes: as *Quadrātes*, *Naidcles*, *Cylindres*. *Rynges*. *&c.*

Beholde now it doth ensue, and also the vsyf vse of it.

Shad

A Table of the Sunnes altitude, for euery hou / Pole mounted, 51. degrees 30. Minutes, exactely calculated.

Houres before n.	12		11	10	9	8		7	6	5	4
Houres after n.			1	2	3	4		5	6	7	8

Si.	G	S	G	g	M	G	M	g	M	g	M	g	M	g	M	g	M	g	M	g	M
	30	♋	0	62	0	59	45:	53	45	45	42	36	42:	27:	23:	18	11	9	28:	1	31.
	25		5	61	54																
	20		10	61	37:	59	21.	53	26:	45	24	36	25	27	6	17	50.	9	9	1	13:
	15		15	61	9:																
	10		20	00	30:	53.	17	52	23.	44	32	35	35	25	16.	17	3	8	16.	0	15:
	5		25	59	41:																
♊	0	♌	0	58	42:	56	34	50	55:	43	6.	34	13.	24	56	15	41:	6	10.	0	0
	25		5	57	34.																
	20		10	56	17:	54	15	48	48	41	10:	32	22.	23	6.	13	50	4	55:	0	0
	15		25	51	43:																
♍	0	♎	0	50	0	48	11.	43	11.	39	53	27	27	8	13	8	55	0	0		
	25		5	48	21:																
	20		10	46	20:	44	37	39	51	32	53:	24	32.	15	27.	6.	8.	0	0		
	15		15	44	25:																
	10		20	42	23:	40	52:	36	18	2	34:	21	24:	12	25:	3	6.	0			
	5		25	40	29:																
♌	0	♏	0	38	30	36	58	32	37.	26	7:	18	3.	9	16.	0	0				
	25		5	36	30:																
	20		10	34	32	33	4	28	55:	22	38:	11	51:	6	7	0	0				
	15		15	32	35.																
	10		10	30	40.	29	15.	25	18	19	14	11	33	3	12:	0					
	5		25	28	48.																
♍	0	♐	0	27	0	25	40	21	51:	15	59:	8	34.	0	16.						
	25		5	25	17.																
	20		10	23	30.	22	22.	18	42:	13	1:	5	45.	0							
	15		15	22	8.																
	10		20	20	43.	19	29	15	55.	10	23:	3	19.	0							
	5		25	19	26.																
♎	0	♑	0	18	18.	17	6	13	38:	8	13:	1	15.	0							
	25		5	17.	19.																
	20		10	15	30	14	48	11	55.	6	35:	0	0								
	15		15	15	51																
	10		20	15	23.	14	13:	10	52	5	35	0									
	5		25	15	6.																
♏	0		0	15	0	13	51	10	30.	5	15.										

When the Sunne entreth the 22 grade of ♋ he toucheth our Horizon at 4 th the morninge. Entring the 22 of ♎ he setteth at 8 in the forme of ♂ at 5 in the first of ♐ at 7.

Note in all my tables one pricke following the Minutes, diminisheth two, augmenteth some smale quantitye

Our elevation of ☽ pole is 51. 30. mi ☽ equinoctiall 37. 30 mi ☽ greatest declinacion of ☽ sonne is. 23 ½ 28.